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AGRICULTURE DEVELOPMENT FUND

Keeping the agriculture and food industries competitive through Research, Development and Demonstration.

Final Report

1.4-28

Wild Plant Harvesting

Conducted by K. Brunner Consulting

Funded by the Agriculture Development Fund

ERDA 1.4-28

WILD PLANT HARVESTING

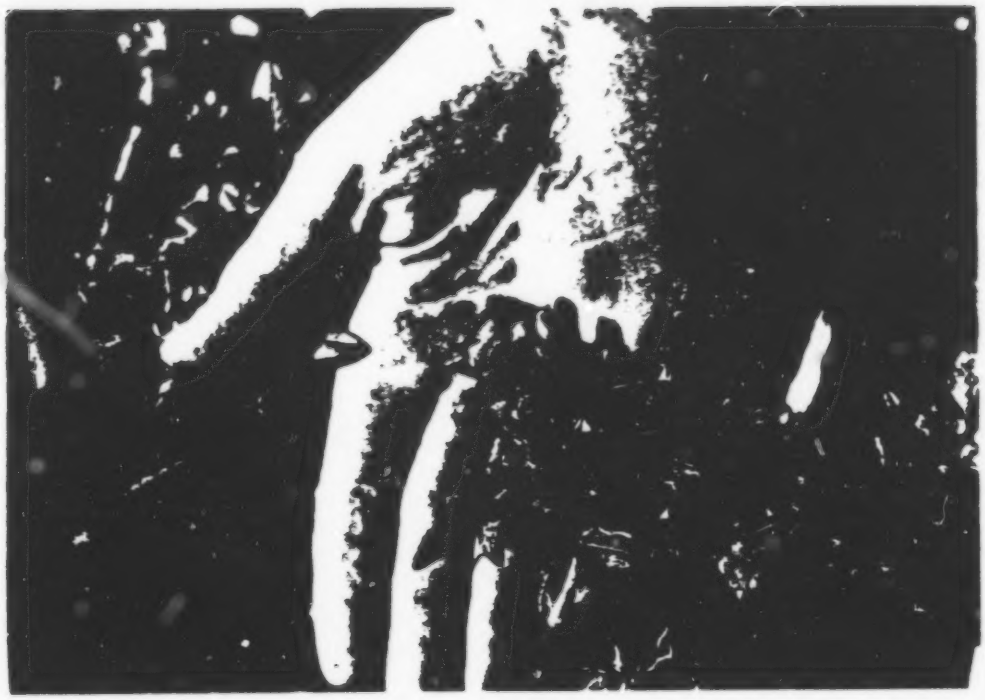
FINAL REPORT

1989

K. BRUNNER CONSULTING

PRIORITY OF PROJECTS

A. Getting Growers Started - Management of Wild Blueberry Stands
B. Planning Session
C. Funding Summary
D. Organize local Associations
E. Set up Depots, Marketing support
F. Involve existing organizations
G. Machinery & Equipment
H. Parks, Recreation & Culture
I. Processing
J. Promotion and Marketing
K. Survey land
L. Contact Agriculture Departments
M. Other Events
N. Extension Support
O. Potato Lake plots
P. Weyerhauser stands
Q. Negotiate Social Service
R. Extension Information, Developed
S. Transportation
T. Education of Foragers



BERRIES WITHERED DUE TO DROUGHT

A. Get growers started in field cultivation and management of wild blueberries

2) get growers to tour each others plots.
3) they have to learn about crop management.
These objectives were orginally slated for after all the growers get their plots set up - 1991, etc.
4) find interested co-operators to manage plots
- do land preparation and renovation for plots.

WHAT WAS DONE

- The original goal was to contact up to 6 farmers in 1989 and start setting up lots in 1989, 90, and 91.
- However, the drought this year, moved this project up to priority number one. Farming wild blueberries is absolutely necessary in order to even out the supply fluctuation of wild picking.
- The extension agrologists from these districts advertised for co-operators
  - Hudson Bay - Don Perrault
  - Meadow Lake - Dave Cubbon
  - Nipawin - Larry Lee
  - Prince Albert - Barry Swanson
  - Shellbrook - Harold Amundson
- 50 plot sites were investigated, farmers were contacted. This was narrowed down to:
  - 6 plots - Meadow Lake
  - 2 plots - Shellbrook (1 small test plot)
  - 6 plots - Prince Albert (small plots)
  - 2 plots - Nipawin
  - 4 plots - Hudson Bay (3 small test plots)
  - 10 large plots - approxiametly 1 acre or more.
  - 10 small plots - 10 ft or less

Garry Brown recommended 1 - 2 acre demonstration plots on private land (if possible) and multiple sites, for these reasons.

a) 1 - 2 Acre Plots - the plots should be small enough so they don't take alot of time and money to manage. They should be larger than research plots, so that the farmer can use his own equipment on it, instead of research equipment.

b) Demonstration Plots - Gerry Inanochko, La Ronge Extension Agrologist, is already doing research plots at Besnard Lake. The farmers on the other hand, should manage the plots as they would a field sized crop, to see how much time and energy it takes, and if they can get a blueberry crop. He advised against asking farmers to do any replicates of treatments because most of them won't.

c) Private Farmland - almost all plots are on

[illegible], and the equipment to handle most management operations. This is necessary for blueberries to be grown economically. A few plots are located on lease land because of the high quality of the stands.

d) Multiple Sites - the distance between Hudson Bay and Meadow Lake is great, and there's alot of variation in between. We don't know which variables will be important in the future and which won't. Blueberry farming in the East could end up being different than in the West. Some variables already identified are:

- species - v. myrtilloides are found in northern Saskatchewan. However Gary Brown found several patches of v.angustifoliem, the maritime specie, in Hudson Bay.

plant communities - blueberries grow under jackpine, poplar and mixed wood stands. The plant community is related to moisture levels, soil type and fertility. We can expect different weed control problems in each type of plant community because each has its characteristic shrubs and herbaceous plants. Multiple sites are also added insurance against crop failure.

- work began on cutting the plots out this fall after a very late leaf drop (Blueberry plants must be dorment - leafless during mowing).
- Brush cutters were used for mowing. All plots are set up for the management of wild stands except for Prince Albert - all these plots are set up for planted blueberries.
- Meadow Lake plots are being set up in co-operation with the National Indian Forestry Institute. N.I.F.I. donates labour for plot preparation using the experience in their curriculiem as follows:

1. One or more students could use these studies as part or all their Directed Study.
2. Two or more students may be hired for summer work monitoring and maintaining the blueberry plots, and finding more candidates.
3. In concert with the 3rd year Management Plan, a Forest Ecosystem Classification study could take place on the blueberry plots (see Pat for further details).
4. Another study might be browsing habits of wildlife in and around blueberry patches.
5. Thinning of trees over blueberries may affect the growth of the lower vegetation, and this may

Saskatchewan Rural Development

Extension Agrologist News

(Prince Albert District)

Extension Service

SPRING 1989

Growing Blueberries

Big, blue, juicy blueberries you say?

A project is being initiated to develop native blueberry stands and also to plant tame blueberries on local farms. Acid soil with a sandy texture is preferred.

The purpose of the project is to evaluate whether blueberries can be "cultivated" in the Prince Albert area. Interested in taking part? Contact the Rural Development office in Prince Albert at 953-2770.

Sask. Rural Development

EXTENSION AGROLOGIST

Meadow Lake
Phone 236-444

May 1989

Kayla Brunner
ERDA Project

Wild Blueberries As A Cash Crop

Although blueberries are one of Saskatchewan's oldest harvested crops, large scale harvesting and marketing began only recently. In 1988, 20 northern stores bought and sold approximately 56,000 lbs. of wild blueberries and cranberries. The total crop value is estimated at $125,000.00 retail.

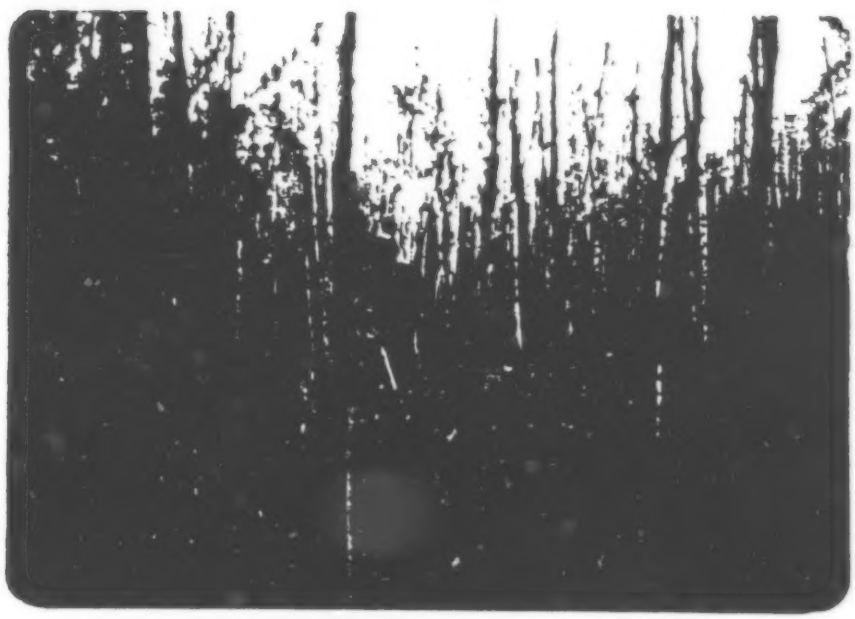
Wild blueberries grow on acidic, northern soils with a pH of 4-6. The management of wild blueberry stands was begun in the Maritimes in the early 1900's. Last year the crop topped a record 109 million pounds. The equipment, management methods, processing and marketing have already been developed, we only have to modify the technology to suit our situation.

Dave Cubbon showed me various wild blueberry stands in the Meadow Lake District. This area seems to me to have good potential for management of wild blueberry stands. I am starting several small (acre) research plots with interested farmers in the northern districts this summer. If you have wild blueberries on your land, and are interested in working on a blueberry plot, call Dave Cubbon for more information this spring. This program is funded by ERDA.

PHOTOS OF BLUEBERRY PLOTS

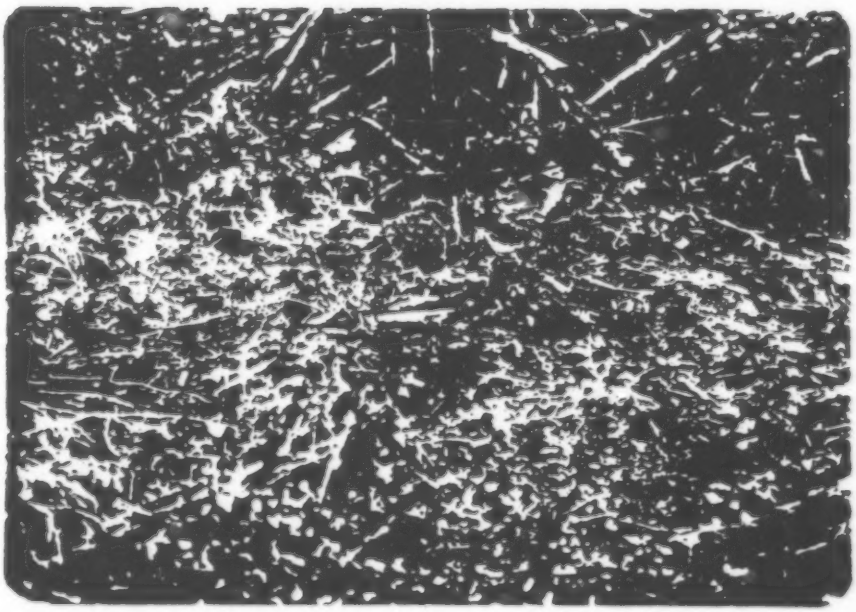
Gloria Forbes blueberry plot site

Nipawin



Ken & Lovie Hamilton blueberry plot site

Hudson Bay



Ken & Lovie Hamilton blueberry plot site

Hudson Bay

Evelyn Schnaider blueberry plot site

Meadow Lake

Evelyn Schnaider blueberry plot site

Meadow Lake

Gus & Isabelle Perschke blueberry plot site

Meadow Lake

Herb & Shirley Nimmrechtper blueberry plot site

Meadow Lake

Chris & Rod Hooper blueberry plot site

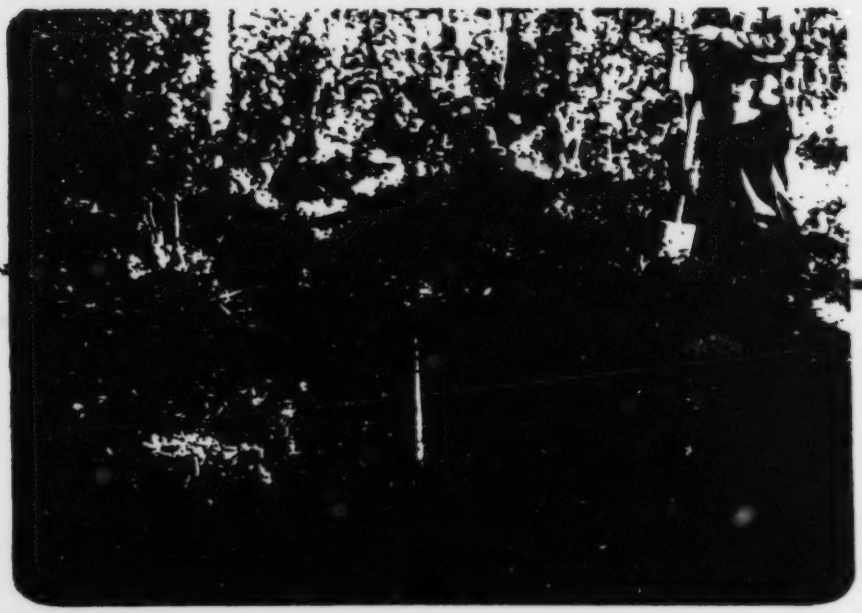
Meadow Lake

Ken Schamber blueberry plot site

Meadow Lake

Dennis Olsen blueberry plot site in jackpine

Meadow Lake



Chris & Rod Hooper blueberry plot site

Meadow Lake

lead to another study conducted by N.I.F.I.
6. The work created by one or more of the above studies may lead to permanent employment for a student from N.I.F.I.
7. A student may go on to develop blueberries for reserves and create economic opportunities through entrepreneurial development.
8. Kalya and/or Dave may volunteer a couple of hours to be guest lecturers for the N.I.F.I. classes involved in this project.

- N.I.F.I. - receives rent for equipment.
- N.I.F.I. - Forestry Instructor, Butch Babbin, evaluated the proposed plots for labour and equipment costs with the contractor.

See Appendix 1 for maps and costs of preparation.

5) Objective - Bring an experienced extension worker from the Maritimes to come to Saskatchewan, evaluate wild stands and fields and advise on the best way to prepare the land.

WHAT HAS BEEN DONE

A important part of the work in developing blueberry plots with farmers was to bring an experienced field worker from the Maritimes to Northern Saskatchewan. He was broght here to answer the questions - Is there potential for managed stands in Saskatchewan? How do our stands compare with the Maritimes?

Gary Brown has worked for the Nova Scotia Department of Agriculture and Marketing as a Berry Technician. He visited a number of blueberry plot sites in June.

He said our land is inexpensive to develop because it is fairly flat, and not rocky. Our blueberry stands look healthy and strong. His main concern is the dryness of our climate and our late spring frosts. These are compelling reasons for establishing managed wild blueberry stands.

In order to get this industry on its feet, he recommends
- 1 - 2 acre plots should be started with farmers
- Extension Agrologists and farmers should tour the Maritime blueberry industry in spring or fall.

Merle Travis, and was an original member of [illegible] for the Buck Owens TV show. Moody's favorite guitar

GEORGE MOODY

tall shadow to walk in," he said. "None of us fall in that category. He's God to the rest of us."

The highlight of the weekend, Sklar said, was the performance next few months includes taping several Number One West shows in October from the Prince Albert penitentiary.

North Sask. has good potential for commercial blueberry crops

By MARKHAM HISLOP
of the Herald

Northern Saskatchewan has good potential for commercial blueberry growing, says a Nova Scotia expert.

Gary Brown, who has worked for the Nova Scotia Department of Agriculture and Marketing helping farmers develop blueberry production, recently toured local wild blueberry stands. The tour covered Hudson Bay, Nipawin, Prince Albert, Shellbrook, Meadow Lake and La Ronge.

"We'd be right in there tomorrow cleaning them up" if some of the tour areas were in Nova Scotia, he said.

Wild blueberries are restricted to acidic, lighter soils such as those of the northern part of the province. They grow particularly well on burned land.

The blueberry plant has a dense underground root system, similiar to quackgrass. When a fire or mower cuts a blueberry stem down, this stimulates the underground roots to send up several new shoots to replace it. Every mowing or burning increases the number of stems in the blueberry field.

Brown said the Saskatchewan climate is much drier than the Maritimes, which gets about 44 inches of moisture annually, so blueberry fields may have to be irrigated. Irrigation would also help control frost because of the shorter growing season, he said. Mulches may also become important moisture-savers, he said.

Brown was surprised by how smooth and rock-free Saskatchewan land was, which makes it suitable for harvesters and mowers. Nova Scotia farmers often spend hundreds of dollars per acre on rock removal, he said, discing the land to smooth it enough for mechanization.

Brown also met with Barry Swanson, Rural Development extension agrologist, and several potential blueberry producers to discuss land preparation, weed and insect control, mowing and blueberry management and marketing. Fifty farmers, interested in co-operating on small-sized demonstration plots, have already had their soil tested for acidity.

Funding for the tour and extension work was provided by the federal government and organized by agrologist Kalya Brunner.

—Submitted Photo

LUSH BLUEBERRIES COULD BE PLENTIFUL HERE
...an expert says conditions are ideal for commercial crops

Berry technician checks potential

NIPAWIN — Gary Brown, a specialist from Nova Scotia, recently toured local wild blueberry stands with farmers, in order to evaluate the potential for blueberry production.

Mr. Brown has worked for the Nova Scotia Department of Agriculture and Marketing as a berry technician, helping farmers develop fields for the successful blueberry industry. The provincial harvest averages 20 million pounds annually.

The tour covered the Hudson Bay, Nipawin, Prince Albert, Shellbrook, Meadow Lake and La Ronge extension agrologist districts. Farmers and Larry Lee, the extension agrologist here, met with Mr. Brown and discussed land preparation, weed and insect control, mowing and burning management and marketing.

Fifty farmers interested in co-operating on acre sized blueberry demonstration plots have already had their soil tested for acidity. Wild blueberries are restricted to acidic, lighter soils of northern Saskatchewan. They grow particularly well on burned over land. Those co-[illegible] and the more stems, the more blueberries.

Mr. Brown said Saskatchewan's climate is dryer than the Maritimes (44 inches annual total precipitation), therefore blueberry fields should have water available for irrigation. Mulches may become important moisture savers here. Because of a shorter growing season here, irrigation may be important for frost control.

He was surprised at how smooth and rock free land here was. This makes it suitable for mechanization (harvesters, mowers). Nova Scotia farmers often spend hundreds of dollars per acre on rock removal, discing and rolling land to smooth it enough for mechanization.

Mr. Brown said the native blueberry stands have good production potential, especially if there is a source of irrigation water. If some of the tour areas were in Nova Scotia, "we'd be right in there tomorrow, cleaning them up."

Carl Perrin of Arborfield, Gary Brown, Keith and Eunice Stacey and Gloria Forbes discuss blueberry regrowth near the Forbes farm.

TENDER

Community Pa[illegible]

TENDER

Gary Brown Tour of Blueberry Plots

June 24 - 28, 1989
Sponsored by
ERDA 1.4-28 Wild Plant Harvesting Contract
Kalya Brunner, Agrologist

1. Objective

- to provide extension information on blueberry production to potential co-operators in the northern Extension Agrologist Districts of Hudson Bay, Nipawin, Prince Albert, Shellbrook, Meadow Lake and La Ronge.

- to look over blueberry stands across the northern Extension Agrologist Districts.

2. Tour Agenda

Sunday, June 25 - Hudson Bay District

- Fir River Road plots - Don Perrault, Ken and Louie Hamilton, Victoria Murdoch

Sunday, June 25 - Nipawin District

- Gloria Forbes' plots - Gloria Forbes, Carl Perrin, Eunice & Keith Stacey.

Sunday, June 25 - Nipawin District

- Jake & Viola Froese's plots - Larry Lee, Jake & Viola Froese, Don & Hazel Peterson

Monday, June 26 - Prince Albert District

- Gina Skoropat's plot - Gina Skoropat, met Barry Swanson after.

Monday, June 26 - Shellbrook District

- Dave Jackow's plot - Dave Jackow

Monday, June 26 - Meadow Lake District

Bernard Dalpe's plot - Bernard Dalpe, Dave Cubbon

Monday, June 26 - Meadow Lake District

- Loon Lake area - Peter Doyle, Dave Cubbon

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Tuesday, June 27 - La Ronge District

- Irene Desjarlais' plot - Irene Desjarlais

Tuesday, June 27 - La Ronge District

- Besnard Corrections Camp's plot - Dave Moroz

3. General Comments

a) The climate is much drier than the east coast (44" of total precipitation, including snow, annually).

- blueberry fields should have water available for irrigation.

- prepare the land well for mowing - clear out debris - since mowing appears to be more feasible than burning, due to the dry climate.

b) You have a shorter season, so late spring frosts could be a problem. Frost control is another good reason for having irrigation.

c) Land preparation

- most of the land is very smooth, has few rocks, and is suitable for mechanization - ie. flail mower, harvester. On the East Coast, alot of time and money is spent in removing rocks, discing and rolling land to smooth it down enough for mechanization. Very little of this type of land preparation would be needed here.

- cut the trees down. Drag the trees outside of the blueberry field and delimb them there. This will save alot of work in cleaning up the tree branches from the ground.

- pick up all of the dead limbs off the ground.

- remove stumps. Most stumps here are small, compared to the east coast, so it might not be necessary to use a stump porter. A claw on a hydraulic arm behind a farm tractor, or chains, could be sufficient.

- mow down live brush.

- pick up all of the rest of the trash with rakes. The ground has to be cleaned as thoroughly as for a garden. Remove even twigs of finger thickness.

. . . 3

- mow down blueberry plants with a mower to a height of less than 1" (one inch). This removes the apical dominance of the stem and stimulates more shoots to grow along the underground rhizomes. For every stem mown down, several new ones grow up, thickening the blueberry stand.

d) Weed control

- our major weeds are - poplar, rose, willow, alder, pincherry, grasses and bunchberry.

- bunchberry is the most serious weed in Nova Scotia. It is not controlled by Velpar. Sarsaparilla was in good condition in the plots sprayed by Velpar at Besnard Corrections Camp.

- method - mow in fall when the plants are dormant (after a few frosts).

- spray in spring with Velpar as early as you can drive on the roads (April).

- to control regrowth of weedy species which grow taller than blueberries during the summer, you can:

i) spot spray with a backpack sprayer.
ii) use a "hockey stick" with a sponge on the end of it, soaked in herbicide. Touch the tall weedy plants, with the hockey stick.
iii) use a rope wick to touch the tall weedy plants.

- apply Round-up or Velpar

e) Recommendations

- to get blueberry farming started in Saskatchewan several plots have already been started in the La Ronge Extension Agrologist District. Start more test plots in all the Extension Agrologist districts visited. Plots should be at least 1 - 2 acres in size. Use all the methods of management - mow, spray, fertilize, etc. and treat these as regular farm acreages. These are not research plots with - many subplots and a variety of treatments.

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- send the Extension Agrologists to see the industry on the east coast.

  - spring - they can see mowing, fetilizing, spraying

  - summer they can attend the growers field days

- spring is probably the best time to tour.

- once the co-operators have taken care of their plots for a year they should also tour the east coast blueberry industry.

Date	Location	History	Topography	Plant Cover	Soil Test	Water Availability	Blueberry Stands
Sunday June 25	Fir River Road Hudson Bay District	300 acres, logged over crown land	Smooth	Poplar Bruch (regrowth)	Yes	None	- 25% blueberry cover - healthy growth - some V angustifolium
Sunday June 25	Gloria Forbes Nipawin District	lease land, private land burned 15 years ago	Smooth	Small Poplar	Yes	None	- 15% blueberry cover (many patches - healthy growth
Sunday June 25	Jake & Viola Froese Nipawin	private land	Smooth	Poplar Jack pine	Yes	Creek, need irrigation on sandy soil	- 15% blueberry cover (many patches - possible danger of frost? - good growth
Monday June 26	Gina Skoropat Prince Albert	private land	Smooth Adrumlin	No trees Plot for cultivation	Yes	Well, creek, need irrigation	- likely good frost drainage
Monday June 26	Dave Jackow Shellbrook	lease land	Smooth	Poplar	Yes	Creek	- 15% blueberry cover (many patches
Monday June 26	Bernard Dalpe Meadow Lake District	private land, burn 1985, 1987	Smooth on hill top	Poplar	Yes	Lake	- 1987 burn - 40% plant cover - 1985 burn - 25% plant cover
Tuesday June 27	Irene Desjarlais Ile a la Crosse La Ronge District	blueberry lease, moved 1988	Smooth, hill top	Poplar cleared out	Yes	Lake	- good regrowth after mowing - 40% blueberry cover
Tuesday June 27	Besnard Corrections Camp La Ronge District	lease, burned and mowed	Smooth	Poplar cleared out	?Yes	Lake	- 50% blueberry cover

6) Soil Testing for Blueberry Plots

It is well known that wild blueberries are restricted to acidic soils. On the East Coast, they grow in pH's from 4.5 - 6.5. Unfortunately, the soil testing techniques vary from province to province and their results are not easily comparable to ours.

A pH of 6.4 was arbitrarily chosen as the upper limit of soil presumed to be suitable for blueberries.

The Saskatchewan Soil Survey collated information on the soils with a pH of less than 6.4 in the agricultural soils of the northern farming fringe. There is little soil mapping information on Northern Crown land.

Approximately 295 square miles have a pH of 6.4 or under.

Approximately 50 square miles of this total are uncultivated.

WHAT HAS BEEN DONE

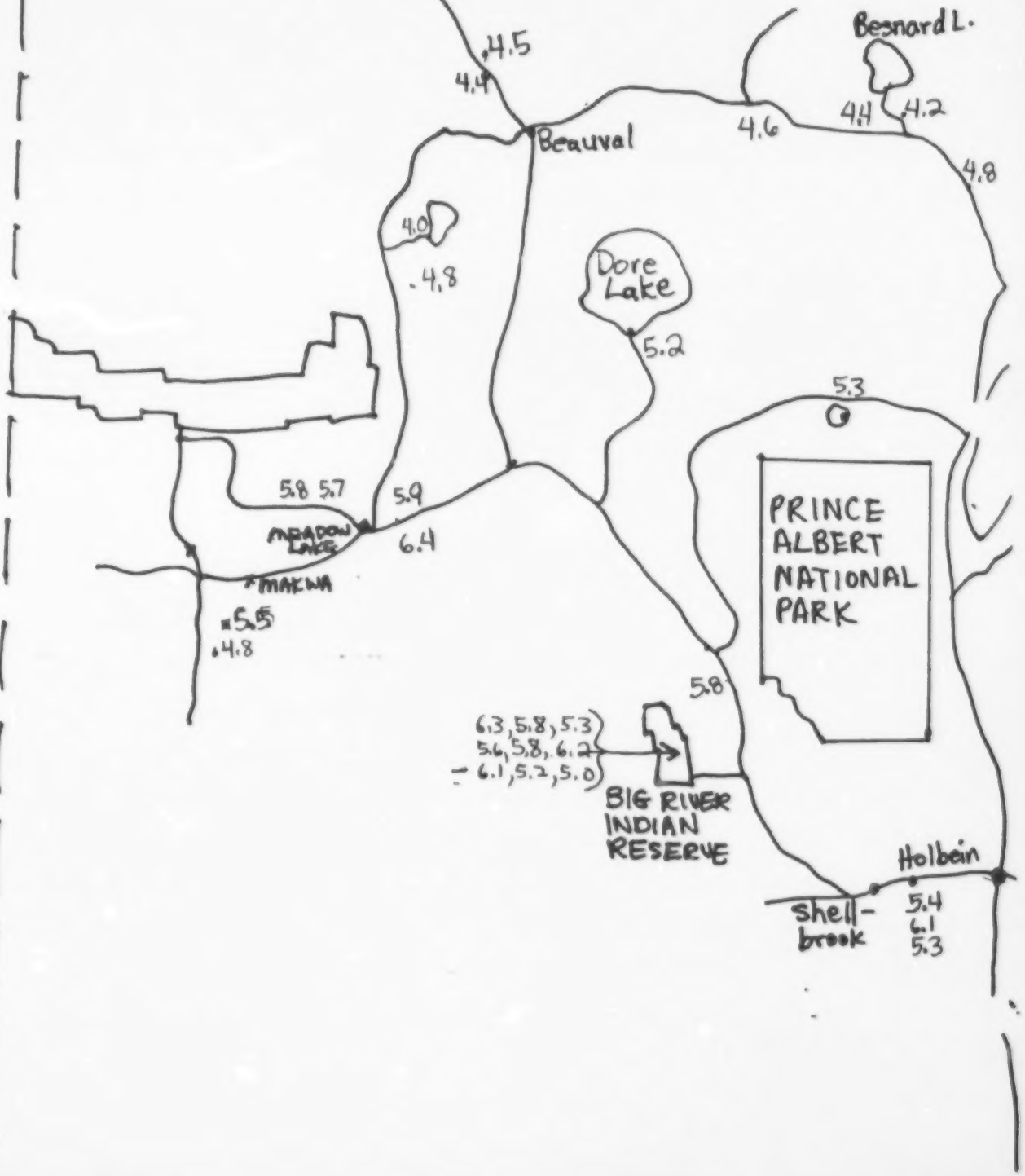
Over 60 soil tests were taken at potential plot sites across the northern agriculture districts of Meadow Lake, Shellbrook, Prince Albert, Nipawin and Hudson Bay. Wild blueberries were growing on some of these sites which are suitable for managed wild stands. Other sites were cultivated fields - suitable for cultivated blueberries. See Appendix 2 for soil test results.

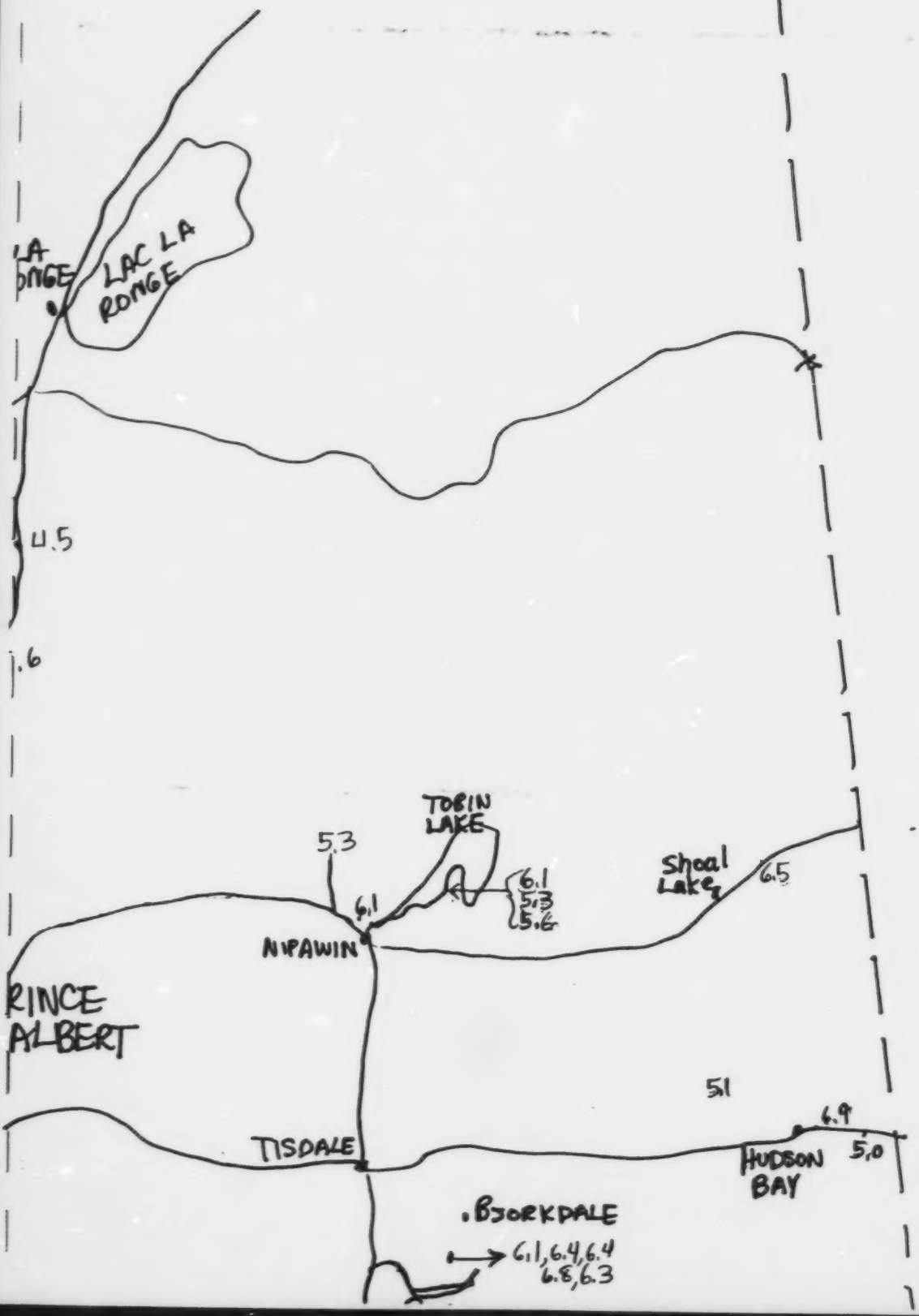
We are slowly learning about the range of pH that wild blueberries will tolerate. Soil pH's taken in wild blueberry stands from 1984 to 1989 are listed on map 1. ~~Too few samples were taken to give~~ statistically results. However, it is interesting to note that:
- the majority of soil tests fell between pH 4.4 - 6.4.
- soil testures ranged from loamy sand, sandy loam to sandy. The A (top) horizon was often organic. No soil sample fell in the heavier clay texture.
- there were greater numbers of lower pH soils (acidic) in the west side of the province than in the east.

Many farmers were interested in planting blueberries in cultivated fields. Based on soil test results taken to date, it would be reasonable to consider only soils with a pH of 6.4 - 5 or less.

MAP 1

PH'S OF SOIL TESTS TAKEN 1984-9 IN NATIVE BLUEBERRY STANDS IN NORTHERN SASKATCHEWAN




LAC LA RONGE
4.5
1.6
TOBIN LAKE
5.3
6.1
6.1
5.3
5.6
Shoal Lake
6.5
NIPAWIN
RINCE ALBERT
51
6.9
TISDALE
HUDSON BAY
5.0
BJORKDALE
6.1, 6.4, 6.4
6.8, 6.3

floor sweeping compounds, shavings, sawdust and lumber.

In September, 1963, Mr. Erickson found he was needing more space for his expanding business, so purchased thirteen acres of land beside the C.P.R. tracks, and moved his equipment to the new site.

A boon to the economy of Meadow Lake, this enterprise was considered small in comparison with other wood product undertakings, with larger investments in the province; nevertheless, it employed from fifty to seventy men. Its closing in 1965 was a disappointment to the employees and businessmen of this area.

Mr. Erickson, also a contractor, was involved with the building of sidewalks and concrete water storage and sewerage facilities. The purchase and sale of pulpwood was another industry in which he was engaged.

BLUEBERRIES

by Bruce Campbell

In the early days everyone living in Meadow Lake and surrounding districts picked wild fruit, in large amounts, which was enjoyed as a daily fresh dessert or preserved for winter use. Blueberries and cranberries were the most abundant, but patches of raspberries, strawberries, chokecherries and pincherries were often found, as well as some black currants and highbush cranberries.

In the early 1930's, Meadow Lake was a trading center, the area was pretty well settled and a road *of sorts* was opened to Glaslyn and south. This encouraged the merchants and traders of Meadow Lake to try and find a market, in the south, for the large amounts of blueberries and low bush cranberries that were available. This was quickly done, and soon most merchants were buying these berries at their stores; some were also bought at the berry patch or from country dealers.

The berries were trucked south and sold in small towns, or direct to farmers and to wholesale fruit companies in North Battleford, Saskatoon or Regina. Good quantities were also sold to city hotels, restaurants and institutions.

To handle the large volume of blueberries and cranberries, proper boxes were required and local mills soon filled the bill. This, together with the picking of the berries, taking them to town, trucking them south, etc. made it possible for a large number of men, women and children to earn extra money, to put food on the table or buy a new pair of shoes and stockings, a few pencils and scribblers and school books for some child, or other necessary items. Some families camped right out in the berry patches, and enjoyed real good wages. People brought blueberries and cranberries to Meadow Lake from north, south, east and west and some travelled over one hundred miles. Many interesting stories could be told of enjoyable times experienced going to, returning from, or during the time spent in a good blueberry patch.

Louis Bedard ready to go for a load of blueberries

As mentioned before practically all merchants in Meadow Lake contributed to, and made money from, the good volume of the blueberry business, although some of them had to sacrifice a few boxes of over-ripe berries to a local wine-maker yearly.

One of the largest berry dealers was Louis Bedard. He had his own berry warehouse and truck. He bought from the pickers at the berry patch, or at his warehouse, also from some merchants in the town and country. He trucked or shipped all his berries south. He was truly the *"Blueberry King"* of Meadow Lake in the thirties. There were hundreds of thousands of pounds of blueberries trucked out of Meadow Lake from 1930-1945. With the opening up of farm and pasture land, adverse weather conditions, and forest fires the berry crop has diminished so that it is of little commercial value today.

BUSINESSES

The business community of Meadow Lake developed in four different stages and on four different sites.

The first business was the Hudson's Bay Trading Post operated by Cyprian Morin. This post opened in 1889-1890 and was on the west side of Meadow Lake and along Backwater Creek. Here Cyprian Morin traded Hudson's Bay Company goods for furs.

Next a church and rectory were built on a plot of land at the west end of Meadow Lake. Father Cochin was resident priest as well as postmaster in these early years.

Just north of where Cyprian Morin managed the Hudson's Bay Post, Henri Ducluzeau opened a log general store, with his partner Camille Bouillet. Ducluzeau's Store was opened in 1913 and was situated on the corner of what is now 9th Ave. and 3rd St. E. In those days it became known as Main Street and later part of the old No. 4 Highway.

B. Planning Session

The following were consulted individually on the direction of this contract.

Clarence Peters	Gerry Ivanochko
Larry White	Bernie Zuk
Pab Orcajada	Len Donais

C. Funding Summary

A summary and analysis of the wild berry and mushroom industry became an added but high priority goal, early in this contract, because there was a need for an overall picture of the industry.

WHAT WAS DONE

The funding summary and analysis (see following pages) was researched and presented at a funding meeting on March 30/89. The analysis divided funding by recipient (how much did each business/person get?) and by area (research, extension, processing, marketing)

RECOMMENDATIONS

1) This summary should be updated annualy
2) The funders should meet regulary (annually?) and share information on their projects in order to:
   - establish funding priority areas
   - evaluate projects on the basis of past performance
   - avoid duplication of projects

D. Objective - Organize local associations -- of pickers, depot operators, berry farmers

An organization for depot operators has been a top priority in 1989, for marketing berries and mushrooms. The purpose of such an association is to guarantee the depots that it will buy any extra poundage that they can't sell locally. The association takes the risk in marketing and is to buy, store, package, ship and sell produce. These depots are all local businesses that buy berries from pickers. They have handled over 90% of the berries with no government subsidies to date.

WHAT HAS BEEN DONE

Several organizational meetings were held for a provincial depot association.

A funding proposal was written under this contract, and sent in to Sask. Power, and rejected in July.

A second funding proposal from the Northwest depot operators was sent in to Sask. Power Fund in November. Results are not yet known. See Appendix 3 for Northwest Saskatchewan Blueberry Association proposal.

To date there hasn't been enough interest to organize meetings for berry pickers, or blueberry growers.

Several organizations were approached on funding equipment for depot owners associations when established.

RECOMMENDATIONS:

Work on organizing - east side depot operators association
- blueberry farmers association, in 1990
- berry pickers association, if there is enough interest

Help depot associations - to do marketing in their first year of operation, if there is a good crop.
- to get financing to upgrade their equipment, if there is interest.

Send information from this contract to depot owners on berry cleaning equipment and storage and handling of berries.

E. Set up more depots and give support to depots

Depots are places where pickers sell wild berries and mushrooms and where buyers buy them. These places need cash, storage, and staff -- so most of them are businesses such as -- confectionaries, grocery stores, tourist lodges and handicraft stores. Several independent berry pickers buy and sell and act as depots.

Before a business owner starts handling wild foods they learn how to buy, store, package, ship and sell; they also get the going prices and are introduced to buyers.

WHAT HAS BEEN DONE

Depots were originally set up in northern Saskatchewan. However, the north suffered a severe drought this year, so the information network stretched southwards and depots were set up on the northern agricultural fringe.

In 1985 - 1 depot started trading
1986 - 4 depots
1987 - 21 depots
1988 - 18 depots
1989 - 32 depots - several new depots had handled berries before and were plugged into the information network.

Late in the season, 24 tourist lodges were approached on handling berries and acting as depots. A few were interested, even though none had a local crop.

The farmers markets have been included in the information network and listed on the Sellers List for 1990.

A large portion of time was spent in meeting prospective depot owners: giving them information on wild foods, helping them get set up, and keeping them in touch with the weekly prices and buyers.

The Buyers List was sent out to all depots on the sellers list and vice versa. Follow-up phone calls were made weekly to sellers to find out crop prospects; and to give leads on buyers. Buyers were called bi-weekly to connect them with sellers.

E. 1989 Sellers List (Depots)

				Handled Berries
	East Side			
	Pelican Narrows	Seepeeseek Camp Eugene Klein	632-2019	—
	Deschambault Lake	Deschambault Lake Oscar Beattie Ken Seibe	632-4425 632-4550	—
*	Denare Beach	Roly's General Store Roly Chretien	362-2122	—
*	Denare Beach	Alpine Convenience Store Dale Markham Rick Reid	362-2133	—
*	Sandy Bay	Leo's Pool Hall Leo & Rhonda Merasty	754-2134	—
*	Choiceland	Winston Grocery Don Chow	428-2222	—
*	Choiceland	Eleanor Ealy	428-2918	
*	Tisdale	Healthy Harvest Foods & Craft Co-op Ltd. Janice Riese	873-4685	✓
	Central Area			
	Pinehouse	Pinehouse Co-op Store Bill Young	884-2112	—
	La Ronge	Robertson's Trading Ltd. Alec Robertson	425-2740	✓
*	La Ronge	Rus Tuk Enterprises Brenda & Jack Emisch	425-2848	—
	La Ronge	Nature Berry Erwin & Gertie Keller	425-3005	✓
	Weyakwin	Thunder Hills General Store Judy Jackson	663-5629	✓
	Candle Lake	Ship's Lantern Resort Hotel Ken McNair	929-4555	—
	Prince Albert	Mable Halkett	922-8436	—

. . . 2

* New depots

Handled Berries

	Prince Albert Wholesale Outlet	The Root Cellar Len Donais	764-4499 ✓
	Besnard	Besnard Corrections Camp Tom McCallum	425-4348 – 884-2150
	Christopher Lake	Logans Family Store Jim Logan	982-2118 ✓
*	Christopher Lake	Elkridge Service Ltd. Ed Andres, Leona Gerwing	982-4322 –
	West Side		
	La Loche	Lucky Dollar Store Warren Muller	822-2333 ✓
*	Beauval	Bouvier Handicrafts Cecile Bouvier	288-2105 ✓
	Canoe Narrows	Marples Confectionary Beatrice Marple	829-2020 –
	Cole Bay	North Haven Lodge Jim Marple	829-4311 –
	Green Lake	Ed & Sons Service Ed Hoffert	832-2132 –
*	Dorintosh	Norma Herriot	236-3863 –
*	Goodsoil	Bargain Finders Store	238-4443 –
*	Pierceland	W.W. McClellan (store) Bill, Judy or Barb	839-2066 –
*	Whelan	Whelan Store Pearl and Harry Neilly	837-4608 –
*	Pierceland	Johnson's Resort	837-4731 –
*	Loon Lake	Pine Cove Resort	837-4612 –
*	Loon Lake	Annie's M & M Store	837-2134 –
*	Ile a la Crosse	M & M Store Ovide Desjarlais	833-2424 ✓

*New depots

Funded By ERDA 1.4-28 Wild Plant Harvesting

Kalya Brunner, Agrologist

1. Objective - Involve existing organizations in wild plant harvesting.

WHAT HAS BEEN DONE

The NorSask Native Outreach workers in Pinehouse and La Loche helped by contacting pickers.

Contacted blueberry and fish processing plants in Newfoundland and P.E.I. They only handle fish and blueberries at different times of the year, even though both products are frozen. This meant that only the co-ops that weren't using their storage buildings could handle berries, because they all fish during the summer.

Gave presentation to the Fishermen's Federation Co-operative Association annual meeting. Asked for fishermen's co-ops involvement. One co-op (Pinehouse) had an empty building that had to be upgraded. There was a possibility that another co-op wasn't planning to use their storage building.

Meadow Lake and District Chamber of Commerce
St. Walburg and District Chamber of Commerce
Co-operated with these organizations on the local Blueberry Festivals, August 18 and 19. They organized the event. We provided services, sold berries, and gave blueberry cooking demonstrations under this contract.

Northwest Tourism Association - on promotion of tours - utilizing wild berries. Gave promotional material. Co-operated with them in the organization of the Blueberry Festivals.

Approached local charities and associations on selling wild berries for banquets and fund raisers. Work done by Food Focus -- see Final Report.

Co-operated with Dept. of Rural Development (Meadow Lake) and National Indian Forestry Institute in establishing Managed Blueberry Stands.

Co-operated with Dept. of Rural Development in Meadow Lake, Shellbrook, Prince Albert, Nipawin and Hudson Bay on Managed Blueberry Stands.

Rural Development Corporations for towns of Porcupine Plain and Hudson Bay. Planners were doing studies on

economic opportunities and were given extensive information on wild plant harvesting and management.

Saskatchewan Farmers' Market Association - Upon request, the Association amended their rules in order to allow individual berry pickers to sell into the southern farmers markets.

RECOMMENDATIONS:

Approach more Chambers of Commerce to promote Blueberry Festivals.

Approach more Rural Development Corporations to fund economic development of wild plants.

Get berry pickers to sell more berries through the farmers markets.

6. Machinery, Equipment

1) Mushrooms

Objective - Make the pattern for small, home-sized mushroom dryers.

WHAT HAS BEEN DONE

Mushrooms were dried in these ways:

In a home food dryer with trays and a fan. Done by Kalya Brunner.

Laying on screens tacked on to 2" X 4" frames in a greenhouse. This was done by Len Donais, Root Cellar, Prince Albert. There were no fans. Sunlight provided heat for drying.

Laying on screens tacked to 2" X 4" frames under greenhouse lights. There was no fan. Done by Kalya Brunner.

Laying on screens with no heat source or fans. Done by Kalya Brunner.

All the mushrooms were sliced approximately 1/4" thick. All the mushrooms dried well, no matter what method was used. It seems that slicing the mushrooms thinly is likely more important for successful drying, than the equipment used to dry them with.

E) Machinery, Equipment

2) Berry Cleaner
Objective - buy the modified blueberry cleaner used for fresh markets. Keep the cleaner running for the summer.

WHAT HAS BEEN DONE

The original berry cleaner, built by the Maine Blueberry Equipment Company cost:

blower cleaner	$ 3,750
grader cleaner	$ 2,500
tilt belt	$ 2,500
pick over belt	$ 2,500
	$11,500 F.O.B. Maine

See Appendix 4 Letter from Main Blueberry Equipment Company

Len Donais, owner of the Root Cellar, Prince Albert felt the price was too high, but wanted to build a cleaner like this one. Building of the berry cleaner was initiated under this contract. Funds were provided by Len Donais from his ADF project for an Agriculture Engineering student to build a cleaner. Funds were partially reimbursed by the Saskatchewan Research Council's IRAP program. The Agriculture Engineering Department Head selected the student Sheldon Gellner, and provided shop space and tools. Photos, specifications, and a video served as a pattern for the cleaner, and were provided under this contract. Because of the drought, there weren't enough berries to run through the cleaner in order to make any necessary modifications.

There were not enough berries to bring a berry cleaner operator out in order to run the cleaner. During his June tour, Gary Brown felt we should be able to run the machine without outside help.

3) Berries - work with fishermens co-op. See F.

4) All wild foods - look into the possibilities for depots to upgrade their storage facilities.

This is a secondary priority for the depot owners. Organizations which have expressed interest in loans for equipment were:

- Beaver River Community Futures Corporation
- Western Diversification

5) Work with PAMI, or College of Agriculture to do trials on equipment.

This is long term, and will be useful once farmers are managing large acreages of berries. They will determine their equipment needs.

4) Planning meeting Sept. 28 on future of plots Dave Cubbon and Don Perrault submitted proposals.

Recommendations

- Top priority is to finish up plots in 1990 with the co-operators and extension agrologists.
- look for irrigation assistance for plot co-operators.
- approach Lands Branch for cheaper rental rates for lease land that is used for blueberry production, because there is no income for several years.
- In the long run - evaluate what it takes to get a good yield of blueberries. What are the optimal factors - soil type?, moisture?, vegetation?. As blueberry production expands map the rest of the province for blueberry production potential
- Extension agrologists and plot co-operators should tour:
  plots in Saskatchewan
  the industry in the Maritimes after the plots are set up.
- Turn attention to the management of other wild berries not yet cultivated.
  ie:) Highbush cranberry
  Chokeberry

Weather and Wild Berries

Most people in Northern Saskatchewan can remember picking wild berries as children. From La Loche to Creighton, from Meadow Lake to Hudson Bay, their stories are pretty much the same:

a) there used to be a lot more wild berries to pick in pioneer days. As the land was broken up for cultivation, a lot of habitat was destroyed.

b) The weather was wetter in the 1940's, 50's and 60's. It has gradually been getting drier through the 1970's and 1980's. Dry weather has drastically reduced the berry harvest - especially blueberries which grow on light land.

c) In the old days, there used to be alot more fires. Since the government has not allowed burning, a lot of pasture land and leaseland that used to have lots of blueberries are now overgrown. There are hardly any blueberries in these places because they have been choked out by too much growth.

- See following page on the history of blueberries in the Meadow Lake District.

According to Ken Jones the Scientific Services Division in Regina, the weather records from the 1950's to the present show that:

- the 1950's were wetter than average
- the 1960's were still fairly wet

the 1970's were drier than average although a few years were wetter than average

- the 1980's were drier than average
- see appendix 0.1 for 30 year rainfall average.

They expect these trends in the future:

- the 1990's are expected to be closer to the average, that is wetter than the 1980's.
- the weather records show a 2°C increase in average temperatures from 1950 - 1980's. It is expected that the average temperature will rise by 1°C during the next 10 years. This will result in:
  - longer frost free season. Less danger from late spring frost.
  - a drying effect.
  - the low pressure zones will migrate further northward, bringing more rainfall which whill counteract the warming trend. The net effect will be the same or more rainfall north of La Ronge (Approximately) and less rainfall from Meadow Lake to Prince Albert to Hudson Bay and southward.

The effect on berry production can only be guessed at. If these predicitions prove to be accurate then wild berry harvesting north of La Ronge should be about the same, decreasing southward.

Managed wild stands wish irrigation would seem to be even more necessary in the future if we experience a net drying trend south of La Ronge.

Recommendation

- Show the blocket to their depots and farmers.

- No pattern is needed for mushroom dryers.

H. Negotiate with Department of Parks, Recreation and Culture

Objective - To ensure that they do not tax wild foraged food products.

WHAT WAS DONE

Rod Thompson, of DPRC was given feedback on this policy titled "Disposition of Non-Timber Products of the Forest".

This policy is due in January 1990. According to Rod, they have dropped the idea of taxing wild foraged food products because of the feedback of many people.

See Appendix 5 Disposition of Non-Timber Products of the Forest

See Appendix 6 Personal Communication to Rod Thompson

RECOMMENDATION:

Check the final policy paper.

3. Processing

1) Objective - Find out what the grading standards are for fresh and frozen food products.

WHAT WAS DONE

Enforcement of regulations is done by the Food and Inspection Branch of Agriculture Canada. I contacted Howard Willems, an inspector with the Branch.

There are no regulations governing wild mushrooms.

The general regulations for fruits would apply for wild berries.

There are some specific regulations for blueberries and cranberries.

No regulations apply to fresh berries, harvested and sold in the province, unless there is a problem with the berries, such as very poor quality.

See Regulations Appendix 7.

I. Processing

2) Objective - Work with northern groups which want to sell wild food products. Have local kitchens certified. Give workshops.

WHAT HAS BEEN DONE

Ile a la Crosse had a local hall kitchen certified by the health inspector. Irene Desjarlais contacted the inspector and set up the April 2, 1990 workshop with Judy Russell.

The Hudson Bay Farmers Market is scheduled for the same workshop on April 7, 1990 with Judy Russell. Don Perrault and LoVie Hamilton are organizing the workshop.

3) Handling Berries
Objective - Since fresh berry sales have been the marketing focus to date, it was decided to have some work done on optimal conditions for storing fresh berries, and methods of extending their shelf life.

WHAT HAS BEEN DONE

A Food Science student was hired under this contract to study optimal storage conditions and extended shelf life. Gerry Wudrich worked under the supervision of Dr. Nicholas Low, of the Department of Microbiology and Food Science. 80% of Gerry's salary was reimbursed by the Saskatchewan Research Council's IRAP program. See Appendix 8 Post Harvest Physiology of Wild Blueberries by Gerry Wudrich.

The three most important things that came out of Gerry's summer work were:

1. To extend the shelf life of blueberries the field heat must be removed within a few hours of picking. Under cool storage temperatures such as 2°C the shelf life of blueberries can be extended to 2 weeks.

If berries are at a warmer temperature, they should be left that way. The worst thing to do is cool them down since they sweat and mold.

2. Vacuum packing or modified atmosphere packaging of blueberries can extend their shelf life to 3 weeks if they are kept at cool storage temperature. Today, most berries are handled, stored and

shipped at refrigerator (40 F) to room temperatures (up to 80 F). Their shelf life is less than a week.

A longer shelf life would take some of the pressure off fresh sales and allow berries to be sold further from home.

3. There are good possibilities for drying blueberries into blueberry raisins. If a low tech method can be developed for drying blueberries then drying could be done in the field in isolated northern communities serviced by plane.

Dried blueberries have most of the water removed, so they would be cheap to ship. There would be no rush to market them since they would resist spoiling.

RECOMMENDATION:

Continue the work on vacuum packing, modified atmosphere packaging and drying of berries.

This work was started on wild blueberries, but should be expanded to include other berries such as highbush cranberries which are plentiful and have a strong flavour.

New ideas for blueberries

by Susan Serge

New research could help expand northern Saskatchewan's blueberry industry.

Production levels could triple if packaging and processing techniques are developed, says University of Saskatchewan professor Nick Low.

"We're looking at two different methods to extend the shelf life (of the berries) with careful control of temperature from pick-up to delivery," he says.

The research was completed by Low's student Gerry Wudrich over a four month period under the federal Industrial Research Assistance program.

Keeping the produce in cold storage when picked, transported and cleaned, can extend the life from 10 days to three weeks.

That life can triple when berries are packaged in a special vacuum process that removes air and replaces it with a mixture of carbon dioxide, nitrogen and oxygen. The process is called modified atmosphere packaging.

Drying the berries can mean a shelf life of nine months or more.

"With these methods, it could increase the time the berries are on the market. They (producers) can pick more and they can ship them outside of northern markets."

But Low notes this research is not quite ready for widespread use. "It's preliminary research done on a shoestring budget. To develop it would require funds from government, private enterprise or both."

Low pursued the idea, along with the other research projects because he is interested in the economy and value added products.

"It's ridiculous to produce products, send them away and buy them back."

Dave Cubbon, Meadow Lake and District extension agrologist, says the research is positive but notes packaging and processing is just one component of the industry.

Most blueberry producers are harvesting natural stands and only a few plots exist.

Cubbon says he hopes to apply to the Agriculture Development Fund this fall along with other agrologists to establish demonstration plots with interested producers.

Calila Brenner of Prince Albert is under contract with the Department of Agriculture to develop the industry and is attempting to organize farmers into a northern blueberry association.

J.Promotion and Marketing

1) Objective - As a member of the Wild Blueberry Association of North America, receive information on marketing and promotion.

WHAT WAS DONE

The annual WBANA meeting was attended in Bangor, Maine in April. (This trip was not funded under the terms of this contract).

Ideas from the WBANA consumer survey were used in the Food Focus survey in this contract.

reviewed.

Several promotional ideas were used:
ie.) Blueberry Festival
ie.) Charities as sellers of berries

Information from their study on Post Harvest Handling of Blueberries was used in setting up the summer student project under the Department of Microbiology and Food Science.

A presentation was given on work done in Saskatchewan by the contractor.

The contractor became a member of the Fresh Fruit Marketing Committee.

2) Objective - Do a wild food use survey of institutional, retail, hotel/restaurant, other outlets.

and

3) Objective - Incorporate information from existing studies.
4) Objective - Cost Analysis

WHAT WAS DONE

Ideas from the mushroom, WBANA and Newfoundland studies were incorporated into the Food Focus blueberry survey. Other wild foods were originally going to be surveyed, but most outlets barely were aware of wild blueberries, let

alone other wild foods.

They surveyed the retail, hotel/restaurant, institutional and other outlets in Regina and Saskatoon for:

- present level of usage
- potential level of usage
- purchasing form (frozen, fresh, juice, pie filling)
- types of distributors
- preferences (cultivated vs. wild blueberries)
- price range preference
- container and size preference
- potential use

See Appendix 9 Wild Blueberry Market Acceptability Survey.

DISCUSSION AND CONCLUSIONS

The general conclusions from the study are on page 22 to page 27 of the report -- Appendix 9

Most commercial outlets prefer
- frozen product
- supplied year round
- lower priced ($1.75/lb to $2/lb) than the fresh product

It was surprising to find such a high demand for frozen berries among the commercial outlets. To date, marketing has been focused on fresh product because sales were mostly to individual consumers (the non-commercial sector). Most consumers, from personal conversations, prefer fresh berries from their farmers market or grocery store. This study has pointed out a new market to us.

While wild berries are harvested in the wild, the supply will fluctuate greatly. Until there is a steadier supply from berry farming, I believe that the sellers should continue to concentrate on the small, high priced niche markets that do not depend on a steady supply.

Examples of these markets are:

Seller	Buyer	Fresh	Frozen	Approximate pricerange per pound for buyers
Pickers	personal sales farmers markets	X	X	$2 - $3
Middleman depots	cottage industries (jam, etc.)		X	$1.50-$2.50
Middleman depots	government sales University	X		$2.25-$2.75
Middleman depots	health food, organic sales	X		$2.25-$2.50
Middleman depots	retail - grocery stores	X		$1.75-$2.00
Middleman depots	fresh fruit stands	X		$1.75-$2.25
Middleman depots	*street vendors	X		$1.75-$2.25
Middleman depots	food wholesalers	X		$1.00-$1.75
Middleman depots	institutional		X	$1.75
Middleman depots	hotel/restaurant		X	$1.75-$2.00

* This is a new market identified by Food Focus.

The supply of wild berries will become steadier and the price of wild berries will likely drop when berry farming becomes established. Then the larger markets, lower priced markets can be tackled.

5) Objective - In-store and restaurant demonstrations and promotion, information and recipes for consumers. This work was contracted to Food Focus.

WHAT WAS DONE

17 recipes were developed, brochure layout and photo was produced. These were not printed up because of crop failure.

Taste testing demonstrations were tentatively set up for one fresh fruit seller but was cancelled due to crop failure.

Food demonstrations were held at the St. Walburg and Meadow Lake Blueberry Festivals.

News release entitled "Royal Gems" was sent to Saskatchewan newspapers.

Blueberries were highlighted in two TV interviews.

In-store demonstrations were cancelled due to crop failure. No berries in the store to promote.

6) Objective - Hold a blueberry festival to highlight wild foods.

WHAT HAS BEEN DONE

Two blueberry festivals were organized in 1989 despite the crop failure.

a) Meadow Lake Blueberry Festival, August 18

Sponsored by the Meadow Lake and District Chamber of Commerce. They organized the event, we provided berries, sold them and gave food demonstrations. This event attracted an estimated 200 people. The Meadow Lake Farmers Market set up a market at the Festival. There were also refreshments for sale.

b) St. Walburg Blueberry Festival, August 19

Sponsored by the St. Walburg Chamber of Commerce. They organized the event -- games of chance, farmers market, art and craft sale, live entertainment, and luncheon. We provided and sold the blueberries, and gave a food demonstration. This event attracted an estimated 200 people as well.

tober.

Two comp... have been contracted to do the work. Bomac Construction of Saskatoon is building the station and already has the basement completed.

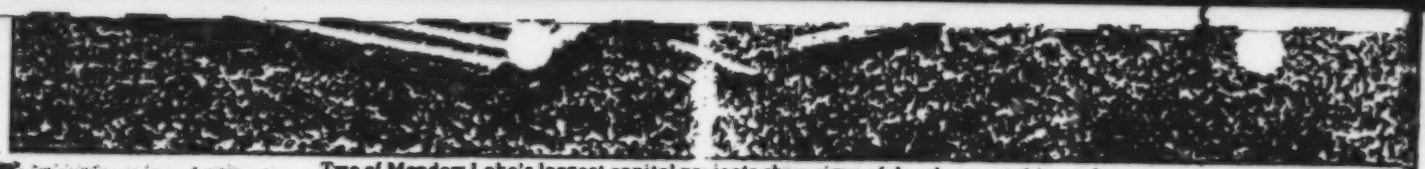
"That was the big part of the job," says Hillestad. "That's in now, and a concrete floor. Next the building will be erected."

C... Trenching is ... for sewer and water mains for the station. Crossman says a total of 3600 meters of pipe will be installed. About 640 metres will be extended into the ... Estate sub-division.

The company is also involved in the other major capital project for Meadow Lake. Carey's will install 300 metres of storm sewer on Seventh Avenue and ... 15 lots proposed for two new streets including Meadow Place and Coupland Crescent already has services.

Curbs and pavement will follow and the project will be complete in ... weeks.

The project, valued at $461,000, will run from Seventh Avenue to Fifth Street West, to the Highway Four service road and Sixth Avenue between Fourth and Fifth Street West. The town has purchased a total of 62 lots from Nor-Sask.



Two of Meadow Lake's largest capital projects show signs of development this week. photo by Susan Sorge

BLUEBERRY FESTIVAL

Tasty opportunity ahead

Meadow Lake residents will have a chance to tickle their tastebuds soon, when the first ever Blueberry Festival begins Aug 18.

Besides being a tasty opportunity for local residents, the festival will promote the northern product, and benefit tourism, says Denise Dodds, of the Tourism Development Group: "It's a win-win situation."

A variety of blueberry products, including fresh blueberries will be on sale. Local entertainment and a fireworks display will be featured. Restaurant owners are being encouraged to promote blueberry products that day.

St. Walburg will also participate by holding a festival Aug 19.

The communities expressed interest in holding the event after initial discussions with Dave Cubbon, Meadow Lake agrologist and an official with the Department of Agriculture. The Chambers of Commerce will co-sponsor the events. The Farmer's market is also involved.

Jacquie Mysko, president of the St. Walburg Chamber of Commerce, said the event is a good opportunity for her community. It will promote the town and bring tourists into the area.

"We do know everyone loves blueberries," she added with a laugh.

Saskatchewan residents south of St. Walburg have a tougher time getting the fresh northern berries, so that will be another drawing card for the festival, she added.

Events were easy to organize

The events were easy to organize, says Dodds. The biggest problem was trying to determine how many fresh blueberries to bring in for the sale. That number was dependent on the success of this year's crop.

Dodds says the festival may be the first project in the area funded under the Community Tourism Assistance Plan, which covers up to two-thirds of the costs. Total expenditures will be between $900-$1,200.

Sorge

Residents compete at provincial level

by Kevin Mandeville

Three Meadow Lake men placed well in the Silhouette Provincial Championships held in Bigger, Saskatchewan. The sport has caught the attention of Meadow Lake says one competitor.

John Lawson was first in the standing A class, first in revolver triple A class, and had the high revolver score of 32 out of 40.

Terry Calvert was first in production in the international class and second in standing in the triple A class.

Alex Selinger was second in unlimited B and third in the revolver A class.

The object of Silhouette is to hit as many targets as possible with 40 shots to complete one match.

Lawson says four different targets are valued at 10 points each. Silhouette involves a .22-calibre handgun class, and a big bore class, (larger than .22).

The big bore class involves hitting steel-plated animal targets from different locations. A shooter hits chickens at 50 metres, pigs at 100 metres, turkeys at 150 metres and rams at 200 metres.

The .22 calibre class involves the same point system but has chickens at 25 yards, pigs at 50 yards, turkeys at 75 yards and rams at 100 yards.

He says the only help a shooter gets is from a spotter who marks score and coaches on technique.

However, only two positions are available to shooters according to the Silhouette handbook. The freestyle position allows any safe position without artificial support for the gun. The standing position is also used but restricts the shooter from bracing his or her arms against the body.

"The spotter is definitely a help, but it's the individual who does the work."

The most common position used by shooters at competitions is the Creedmore position. This allows the shooter to lie on his or her back with the revolver held on the side of the knee pointed at the target. The shooter has the option to shoot with his/her right or left arm depending on which is more comfortable.

"The Creedmore is by far the best," says Lawson.

The four also competed in the Western Canadian Silhouette Championships in North Battleford, and the provincials were held Aug 4-6.

In the future, Lawson would like to continue shooting competitively and for fun.

"I will be shooting until I can no longer hold a gun."

7) Objective - Work with a charity or organization in selling a wild food during their fund raising drives.

WHAT HAS BEEN DONE

73 organizations and charities were contacted (Food Focus). The Girl Guides, in particular, were interested in pursuing this in 1990. They have been given information on wild berries and discussions are continuing this winter.

Under this contract, approximately 50 lbs. of blueberries were supplied to Youth Unlimited of Regina for their luncheon kickoff to Blueberry Week. They were promised 100,000 lbs. of blueberries by SIAP, but due to the 99,960 lb. shortfall in deliveries, the campaign was cancelled. Mrs. Gracey was approached about another campaign in 1990 but was not interested.

RECOMMENDATION:

Continue working with Girl Guides on berry sales.

8) Objective - Explore the possibilities of special promotion with Tourist Information Centres.

WHAT HAS BEEN DONE

Denise Dodds, of the Northwest Tourism Association worked closely with the contractor on special promotions such as the Blueberry Festivals.

She was given photos and information for several tour packages.

9) *Objective - establish a roadside stand to serve the tourist market. Tourists pay the highest prices and shipping costs are low, as the products are harvested locally.

WHAT WAS DONE

- The Dept. of Highways was approached on regulations they are as follows:

1) to apply for a permit for a roadside stand a person must
   - draw up a plan of the highway and the stand
   - the stand must be 125 feet away from the center from the highway
   - if the stand is set up on private or leased property (ie: a gas station property) then the Dept. of Highways has no jurisdiction as long as the stand is temporary, doesn't cause congestion to/from the highway. There has to be an access road or pull over beside the highway.
   - if the stand is set up on unleased land (Crown Land) 2 permits are needed from the Dept. of Highways. One for a stand, one for a sign on the highway. 1 permit is needed from Dept. of Parks, Recreation and Culture - miscellaneous use permit.
   - if any trees are to be cut, another permit is needed from Dept. of Highways.

K9) Individuals have been interested in setting up roadside stands on several sites.

1. Timber Cove turnoff - The Timber Bay pickers were happy to sell [illegible] at this turnoff. The Honey Hut was contacted about buying their roadside stand.

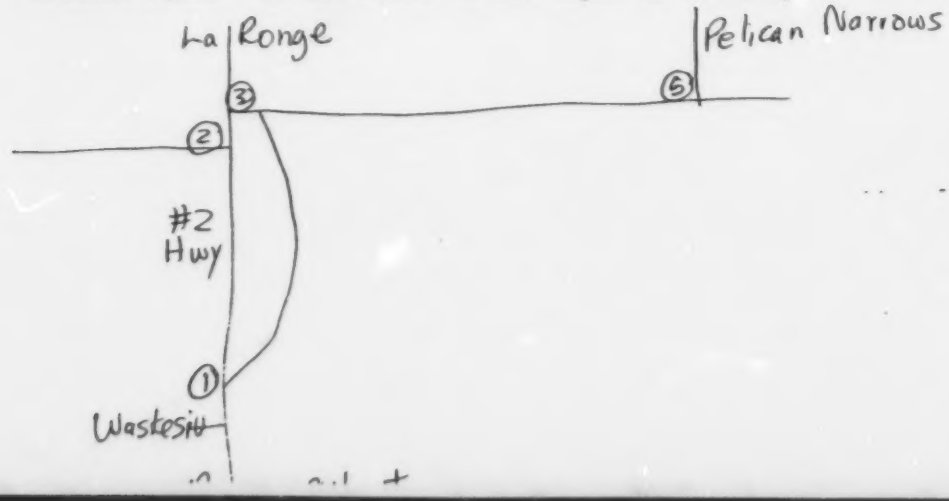
2. Besnard turnoff - The Hall Lake pickers asked about setting up at this site, in 1989. There was no access road. However, in 1989 the Highways crew put in an access road for a camp, so this site is available with a road for 1990. The ladies have been contactred on applying for this site.

3. Creighton turnoff - Mrs. Bird has a house just off the highway. She sells here every year and has signs advertising "Berries for Sale".

4. Nipawin - two farmers were planning to set up stands near town. One has a strawberry planting on the highway, so he sells directly off the field.

5. Pelican Narrows turnoff - no interest.

6. Beauval Forks - no interest. A new depot is close by.



10) Objective - Work with Northern Tourist Lodges

WHAT WAS DONE

2 lodges have been berry depots for several years
- North Haven Lodge, Canoe Lake
- Seepeeseek Camps, Pelican Narrows

11) Objective - Get more wild foods sold through farmers markets

WHAT HAS BEEN DONE

In January, 1989, the Saskatchewan Farmers Market Association was approached to allow easier movement of northern berries into southern markets. They responded by passing a resolution allowing non-local berry pickers to become members of southern farmers markets. One person can deliver the berries for many pickers as long as their names are listed and given to the farmers market. See Appendix 10 . The farmers markets are limited to pickers. Depots, dealers, charities, retailers, wholesalers, etc. cannot sell into this market.

Several pickers were planning to sell into the farmers markets.

The farmers markets across the province have been selling wild berries for years. So far, I have not heard of any wild mushrooms or herbs being sold. The markets were contacted on the types of wild berries they have sold in the past. This information has been recorded and included in the updated Sellers List.

RECOMMENDATION

Update the Sellers List annually.

There is room for more sales of northern berries in the south.

J. PROMO AND MARKETING

Recommendations

- Expand the market survey outside of Saskatoon and Regina.

- Send information on Blueberry Festivals to local economic development groups and Chambers of Commerce.

- Print up promotional literature.

- Follow up on interest in marketing by a charity.

- Survey the rest of the tourist lodges in order to increase the number of depots.

K. Survey Saskatchewan, to determine acreage of land producing wild berries and mushrooms.

The focus of this contract is on those wild foods which have been sold commercially (stores, farmers, markets, etc.)

WILD MUSHROOMS
- boletes
- morels
- pine mushrooms
- chanterilles

WILD BERRIES
- wild blueberry
- wild cranberry (lingonberry, low bush cranberry)
- chokecherry
- wild saskatoon berry
- pin cherry
- high bush cranberry

The purpose for mapping is twofold

1) provide information to local communities on where to pick sites for growing or managing wild plants; and find sites for wild picking of mushrooms. Local people generally know where to pick wild berries, but most are still unfamiliar with mushrooms.

2) give information to planners so they have an overall picture of how large a resource [illegible] should be put into development.

Wild Mushrooms

All mushrooms need a lot of moisture in order to fruit. They also need certain levels of moisture over an extended period of time before fruiting or they won't come up. Most mushroom harvesting has been done on both coasts where the climate is wetter. Between 1984 and 1989 there has only been one year with a good harvest (1987). Unless the climate becomes wetter, mushrooms may remain a once in a few years crop.

* Boletes - are difficult to map because they grow under poplar, birch and jackpine. They can be found almost everywhere in a wet year.

* Morels - grow best in areas that burned during the previous year. The morels dwindle after the first year. They fruit in spring after the poplar leaves come out. The previous years forest fire maps are good for morels, but they are not completed until spring of the following year. For example, the 1988 fires are mapped and completed by April or May of 1989. The 1988 maps are not generally very helpful by 1990, because the morels will have declined.

* Chanterelles & Pine Mushrooms - these two mushrooms fruit from mid to late summer until frost. They both establish mycorrhizal relationships with jackpine and are characteristic of jackpine stands.

WHAT WAS DONE

Forestry inventory maps were chosen because the scale is large, detailed and easy to use in the field. The maps code for crown cover, tree type, height and drainage.

Softwood→S 15 B€% tree cover jp-jackpine
↑height

The chanterelles and pine mushrooms do not grow in all jackpine stands, only certain ones. In order to find trends in the characteristics of these strands, a lot of field checking (ground truthing) is necessary. This is straight forward in a wet year, when the mushrooms are abundant. Since this was a dry year, there were very few mushrooms to check. Therefore a section of highway between Green Lake and Ile a La Crosse was chosen for mapping, because the [illegible] workshops. The sites were not all the same, but they had this range

1) jp - pure jackpine stands
2) Crown Cover
   B - 30 - 55%
   C - 55 - 80%
3) ground cover - reindeer mos.
4) all sites were sandy, well drained. Many sites were on eskers.

All the sites along the highway were checked individually and rated.

BLUE - high priority sites, ideal growing conditions; these sites grew mushrooms in 1988 or looked very similar to those that did.

YELLOW - low priority sites; may be worth checking in wet years.

See Appendix II Area Mapped for Mushroom Potential

Wild Berries

* Wild Blueberries - are naturally restricted to acidic soils. Limited soil survey work done north of the Forest Boundry, indicates that most northern soils are acidic. Blueberries almost always grow after a fire almost everywhere in the north.

Fires remove the apical dominance of above ground shoots, stimulating the growth of many times more shoots from the extensive underground rhizome system. Berry production is greatest a couple of years after a fire, decreasing steadily as the blueberries are choked out by forest regrowth. To get a good indication of how much land has harvestable berries, and where it is, one can look at:

- forest fire maps for the past 10 years.
- roadside ditches (sandy areas)

WHAT WAS DONE

1989 was a record breaking year for forest fires. The Forest Fire Control Branch of the Department of Parks, Recreation and Culture will complete the 1989 maps by spring 1990. Therefore, the 1980 - 89 maps for this report will be submitted altogether on one map in spring also.

Land South of the Forest Boundary has been soil surveyed. Dr. Rostad of the Saskatchewan soil survey unit, ran a computer program listing the land discriptions of acidic soils north of Kindersley. 295 square miles are acidic. 50 of these are uncultivated and acidic. Uncultivated land is a priority because it is suitable for the management of wild stands where as cultivated land is only suitable for planted blueberries.

Some of the land is these 50 square miles, such as the solonetzic soils, are unsuitable as well. Mapping and ground truthing all this land is going to take a lot of work especially when we don't yet know the range of soil types that blueberries are growing in. This effort could be warranted as blueberry production expands.

This year, the extension agrologists contacted farmers with wild blueberries. We evaluated and soil tested over 50 sites and started preparing plots. See section on Getting Growers Started - management of wild blueberry stands.

OTHER WILD BERRIES

No attempt at mapping the distribution of other wild berries was discussed in the original proposal map of sale (farmers markets and depots).

* Dry ground cranberry- grows in northern Saskatchewan on acidic soils, often under jackpine and spruce.
* Highbush cranberry - usually grows in the moist alluvial soils in stream beds and river valleys. It prefers partial shade. It is found as far south as the Assiniboine River System (Brian Simm, personal communication), and in the streams running off the Porcupine and Pasqua Hills. It grows on some islands in the North Saskatchewan River. It is scattered across the north. This plant has some commercial advantages:
  - it blooms late in spring so usually escapes frost
  - grows in wet areas so usually escapes drought
  - it is easy to pick
  - each plant produces alot of pounds of berries

* Chokecherry and Saskatoonberry - these berries are characteristic of the prairies and practically disappear in the northern forests. Judging by the numbers of farmers markets handling them, they are well distributed across the province.

* Pincherry - there are not usually heavy crops on pincherries, so these are slower picking in general. They grow in disturbed soil (ie: roadsides) across the north and are also traded in half a dozen southern farmers markets.

RECOMMENDATIONS

Mushrooms - we need a wet summer, with good mushroom growth, in order to check the accuracy of the mapping before continuing any further. The areas along or near the roads are higher priority because they are easy to reach.

Get forest fire maps of the previous year out to communities if they

Blueberries - as the plots respond to management and start to produce determine which factors (soil type, drainage, habitat, original plant cover, etc) are present in good producing stands when there is an expansion in blueberry production it will be worth the time and effort to map and ground truth all the acidic soils in agricultural zone.

Other wild berries - find out more on the quantity and distribution of other wild berries.

4. Contact Other Departments of Agriculture

Objective - Find out what type of government programs and services were used to develop the industry.

Which other organiztions and departments were involved by the Department of Agriculture.

WHAT HAS BEEN DONE

These provinces and states were approached for information:

B.C.	Quebec	Newfoundland
Manitoba	Ontario	Nova Scotia
Maine	New Brunswick	Minnesota
P.E.I.		

Some information has been received, but much is still coming in. Most of the information received is relevant to field scale [illegible] ground.

See Appendix 12 for a list of information.

Types of wild plants considered:
- wild mushrooms - no departments have done work on this.
- wild berries - all the work received to date was about blueberries. Newfoundland has been the only exception, with work on Partridge berries.
- wild ferns - some research work in New Brunswick.

Successful programs in other provinces and states:

a) All of the provinces and states contacted employed either a blueberry or Small Fruit Specialist. The small fruit specialist concentrated on blueberries, strawberries and raspberries. The continuity of service and leadership is probably the single most important element in successful programs.

No information on the costs was available.

b) Most of the provinces and states contacted have local growers associations.

Their roles have been to:
- initiate marketing studies - Nfld.
- apply for funding for research
- get information to members through field days, meetings, letters
- do marketing
  - the producers have to sell all their berries to the Association for marketing (except sales of berries direct to consumers - farm gate) Michigan Blueberry Growers Association.
- levy fees to their members to pay for their activities.
  - $10/acre of 5 year old plants - Michigan Growers Ass'n
  - 1/4 cent/lb of berries grown - WBANA
- do promotion through brochures, recipes, posters, trade shows -

To date I have received replies from:
- Nova Scotia Blueberry Growers Association
- Newfoundland Blueberry Growers Association
- Ontario Blueberry Growers Association
- Wild Blueberry Association of North America
- Michigan Blueberry Growers Association

RECOMMENDATION:

Report on this area in 1990 as soon as the rest of the information is received.

M. Other Events, Presentations

a) Food and beverage showcase, April 8, 1989 see following page
b) Wild Berry Presentation, Agriculture Board of Directors, April 5 1989 see following page
c) Wild berry and mushroom Harvesting Presentation to Agriculture Caucus, April 24, 1989 see following page
d) Opportunity Seminars - display on wild food harvesting
   - Preeceville, March 21st
   - Hudson Bay, March 22nd
e) Tour Newfoundland fish/blueberry processor, who was interested in setting up a berry processing plant in Saskatchewan
f) Regina Agribition - organized and ran the Northern Saskatchewan Foods Booth Nov. 24 to Dec 2, 1988. All members of North Sask. Wild Foods Association helped.
g) Department of Parks, Recreation and Culture - Road Closure Program for increasing Wildlife. D.P.R.C. checked over the road closures the field with myself and berry pickers from different [illegible] planned for closure because they provided access to major berry [illegible] Pinehouse, Timber Bay, Weyakwin.
h) Media - CBC radio interview - Tom Roberts, August
   CBC radio interview - Rosalee Woloski, August
   BI-TV interview, August
   Newspaper articles on blueberry plots - June - Meadow Lake, Shellbrook, P.A., Nipawin and Hudson Bay newspapers.

N.-Extension support for growers is essential objective - Collect data on economics of plots. This work was slated for 1991 etc.
-Objective - help with present ADF Management of Wild blueberry stands in La Ronge district if necessary (Not necessary as Gerry Ivanochko employed a summer student).

O. Set up research/demo plots at Potato Lake Horticulture Research Site, near La Ronge. This project was dropped as Yvonne Boy - based in La Ronge - was not able to work on this project.

P. Management of Weyerhauser Reforestation Stands. Objective - set up plots to investigate the possibility of managing blueberries as a nurse crop in reforestation.

WHAT WAS DONE

Met with Roman Oroniuk, Weyerhaeuser forester on a future project. [illegible] received, including these suggestions.

When doing work on reforestation areas, consider these factors:
- the different ways the soil was prepared for planting.
- heat retention of the soil
  soil type
  amount of debris and color
- plant cover before and after reforestation
- soil - texture
  - moisture
  - nutrients
- aspert and slope
- year of replanting
- occurence of late spring frosts

The forester felt that so many factors were relevant here, that this would be a major undertaking. This project was given a low priority, no work was done in 1989.

Q. Negotiate with Department of Social Services

Objective - Get an agreement from them not to cut benefits to pickers.

WHAT WAS DONE

Alison Stickland of the Northern Affairs Secretariat approached them several times and received verbal agreement, but nothing in writing.

RECOMMENDATION:

Written agreement is necessary. This is likely work for local associations.

R. Extension Information

Objective - Suitable extension information should be produced for mushrooms and berries.

WHAT WAS DONE

Blueberry video - clips on managing blueberry stands were put together in a 2 minute video and given to the Department of Rural Development offices in Meadow Lake, Shellbrook, Prince Albert, Hudson Bay, La Ronge and Nipawin.

These videos are to show at meetings, on TV, to co-operators, at shows.

Mushroom video - footage on summer mushrooms has been on video since 1988. More footage was taken this year, but due to the dry spring, the remaining footage on spring mushrooms will be taken in 1990.

17 recipes for wild blueberries were developed by Food Focus. (see their report App. 9)

Manual on wild plant harvesting - photographs were taken for this. This is scheduled for 1990 since work was done on 3 other videos and pamphlets.

RECOMMENDATION:

Finish the mushroom video, if there is good weather and spring mushrooms.

Work on wild plant harvesting manual.

Distribute these videos and pamphlets to the local TV, radio stations, schools.

5. Transportation

Objective - start a bussing system in one community and keep it running.

WHAT WAS DONE

Local bussing was tentatively set up in Pelican Narrows but there was no harvest. Depot - Seepeeseek Camps.

There was a harvest at Clapsons Burn, approximately 20 miles from both lie a la Crosse and Buffalo Narrows.

A dozen pickers were asked if they were interested in a bussing set up but they all had cars and said most of the other pickers did too. These were about the only two communities where there was any kind of harvest to speak of.

[illegible]

RECOMMENDATION:

Try local bussing again in 1990, if there is a good harvest.

7. Education for Foragers

Objective - meetings, workshops with pickers
- meetings with town councils on the harvest
- meetings with local groups - trappers, fishermen, co-ops
- meetings with mine workers

WHAT WAS DONE

Since there was a crop failure in 1989, there was almost no local interest in workshops or meetings.

A presentation was made to the Fishermen's Federation Co-op Association.

Presentations were made to the Handicraft Co-ops (many of their members are berry pickers).

- [illegible] Handicraft Co-op
- [illegible] Handicraft Co-op
- [illegible] Handicraft Co-op
- [illegible] Handicraft Co-op

A presentation was made to the Hudson Bay Farmers Market on wild harvesting.

Two presentations were made for the Hudson Bay Opportunities Seminar and the Preeceville Opportunities Seminar.

RECOMMENDATIONS:

Send relevant material from this report to town councils, economic development groups, farmers markets, when it becomes available.

~~Appendix 2~~

~~SASKATCHEWAN SOIL TESTING LABORATORY~~
~~FERTILITY ANALYSIS~~

~~Date: 04-10-86~~
~~S.T.A.P. [illegible]~~

1986 ~~Page 1 of 1~~

* Existing wild blueberry stand

Lab Number	Client Identification	Texture	pH	Conduct mS/cm	NO3-N ppm	P ppm	K ppm	SO4-S ppm	
~~J 86-3002~~	~~[illegible]~~	~~Organic~~	~~4.6~~	~~0.2~~	~~19.0~~	~~5.0~~	~~200~~	~~0.5~~	
J 86-3003	BERNARD LAKE	Loamy Sand	4.2	0.1	0.5	22.5	110	5.0	*
~~J 86-3004~~	~~SARAH NORTH FARM~~	~~Loamy Sand~~	~~4.9~~	~~0.2~~	~~1.5~~	~~23.0~~	~~230~~	~~3.5~~	~~*~~
~~J 86-3005~~	~~PENN SHORE RESERVE~~	~~Sandy Loam~~	~~7.5~~	~~0.2~~	~~5.0~~	~~29.0~~	~~170~~	~~4.0~~	~~*~~
J 86-3006	KNOX BLAIRS LAKE	Loamy Sand	5.3	0.1	0.5	4.0	75	4.0	*
J 86-3007	ZONE OF SHORE LAKE	Sand	4.5	0.1	0.5	23.0	80	3.5	*
J 86-3008	KINGSBURY PT OSBORNE	Sand	5.2	0.1	0.5	11.5	60	3.5	*
J 86-3009	[illegible]	Loamy Sand	4.8	0.1	0.5	29.0	140	3.5	*
J 86-3010	[illegible]	Loamy Sand	5.1	0.1	0.5	23.0	100	3.5	*
J 86-3011	[illegible]	Loamy Sand	4.6	0.1	0.5	24.0	105	3.5	*

~~Dead~~

~~SASKATCHEWAN SOIL TESTING LABORATORY~~

~~DATE:10/CO/04~~
~~SCARDEN-SOIL:CD4-0044/0050~~

~~AUG 14 1984~~

~~COMPLETE FERTILITY ANALYSIS~~
~~[illegible]~~

1984

~~PAGE 1~~

SAMPLE #	CLIENT SAMPLE NUMBER	ORG MAT	LIME	TEXTURE	pH	COND mS/cm	NO3-N	AVAILABLE NUTRIENTS P	K	SO4-S
								lb/ac		
CD4-0044	1 0-6 A.JOSEPH WEST	LOW	ABSENT	LMY SAND	6.3	0.30	2	24	100	17
CD4-0045	2 0-6 J.MCADAM	LOW	ABSENT	LMY SAND	5.2	0.72	1	67	160	>40
CD4-0046	3 0-6 A.JOSEPH EAST	LOW	ABSENT	LMY SAND	5.8	0.23	1	56	190	10
CD4-0047	4 0-6 L.WEAKIS	LOW	ABSENT	SDY LOAM	5.8	0.22	1	57	130	7
CD4-0048	5 0-6 Y.MCKIN	LOW	ABSENT	LMY SAND	5.3	0.28	2	102	300	15
CD4-0049	6 0-6 A.WHITEFISH	LOW	ABSENT	SDY LOAM	5.8	0.32	2	63	190	19
CD4-0050	7 0-6 BIG RIVER RES.	LOW	ABSENT	SDY LOAM	6.2	0.21	1	56	200	7

COMMENT: NATIVE BLUEBERRY PLOTS

pH - saturated paste

DATE 23-09-87

1987

Client	Texture	pH	Conduct mS/cm	NO3-N ppm	P ppm	K ppm	SO4-S ppm
NORTH OF GRID 3 MILES	Loamy Sand	4.4	0.1	0.5	50.0	50	2.5
3 DESJARLAIS ILE A LA CROSSE	Sand	4.5	0.1	0.5	11.5	40	4.0
A OPEKIHEN ENGLE LAKE	Sand	4.8	0.1	0.5	38.0	55.	3.0
BUENOFFS ILE A LA CROSSE	Sand	4.4	0.1	0.5	21.5	35	5.0
M. LEON – KELSEY LAKE	Sand	4.0	0.1	0.5	10.0	40	5.5
T. HAMILTON CLEAR LAKE	Sand	4.8	0.1	0.5	30.0	60	2.5
[illegible]	Sand	4.4	0.1	0.5	19.0	30	3.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	5.2	0.1	0.5	[illegible]	[illegible]	4.5
[illegible]	[illegible]	4.5	0.1	0.5	[illegible]	[illegible]	3.5

SASKATCHEWAN SOIL TESTING LABORATORY
FERTILITY ANALYSIS
xxxx. Brunner Consultingxxx

Date: 11-07-89
K. Brunner IB-17549/17611

* existing wild blueberry stand

	Lab Number	Client Identification	Texture	pH	Conduct ms/cm	NO3-N ppm	P ppm	K ppm	SO4-S ppm	
P.A.	IB-17549	Brillinger 0-6	Sandy Loam	7.0	0.2	2.5	20.5	[illegible]	2.0	Laura Brillinger P.A.
	IB-17550	Brillinger 6-12	Sandy Loam	7.0	0.1	1.0		-	2.0	
	IB-17551	Brillinger 12-24	Sandy Loam	6.9	0.1	1.0	-	-	1.0	
P.A.	IB-17552	DT Tkachuk 0-6	Loamy Sand	6.1	0.1	[illegible]	37.0	165	4.0	Danny + Marilyn Tkachuk P.A.
	IB-17553	DT Tkachuk 6-12	Loamy Sand	5.9	0.1	2.0	-	-	2.5	
	IB-17554	DT Tkachuk 12-24	Sand	6.1	0	4.5	-	-	6.5	
P.A.	IB-17555	Callbeck 0-6	Clay Loam	6.4	0.2	8.0	28.5	95	1.5	June Callbeck P.A.
	IB-17556	Callbeck 6-12	Sand	5.7	0.1	0.5	-	-	5.5	
	IB-17557	Callbeck 12-24	Clay Loam	6.5	0.1	3.0	-	-	1.0	
P.A.	IB-17558	Skoropat 0-6	Loamy Sand	6.4	0.1	1.5	17.0	120	2.5	Gina Skoropat P.A.
	IB-17559	Skoropat 6-12	Loamy Sand	6.7	0.1	0.5	-	-	3.5	
	IB-17560	Skoropat 12-24	Sand	7.0	0.1	0.5	-	-	3.0	
P.A.	IB-17561	Denesyk 0-6	Sandy Loam	6.6	0.2	4.0	>60	>450	4.5	Gerrie Denesyk P.A.
	IB-17562	Denesyk 6-12	Sandy Loam	6.6	0.2	7.0	-	-	5.0	
	IB-17563	Denesyk 12-24	Sandy Loam	6.9	0.2	4.0	-	-	10.5	
P.A.	IB-17564	Zelensky 0-6	Clay	7.4	2.8	72.5	22.5	300	>12	Audrey Zelensky P.A.
	IB-17565	Zelensky 6-12	Clay	7.6	3.0	11.0	-	-	>12	
	IB-17566	Zelensky 12-24	Clay	7.6	2.8	75.0	-	-	>12	
* Indian Bay	IB-17567	L Bracken Res Lot -6	Loamy Sand	6.9	0.2	0.5	14.5	70	4.5	Lockie Bracken H.Bay *
	IB-17568	L Bracken Res Lo 6-12	Loamy Sand	6.2	0.1	0.5	-	-	1.5	
	IB-17569	L Bracken Res [illegible] 12-24	Loamy Sand	6.1	0.1	0.5	-	-	0.5	
P.A.	IB-17570	Macgee 0-6	Loam	5.9	0.3	30.5	32.0	155	5.5	Olive MacGee P.A.
	IB-17571	Macgee 6-12	Loam	6.2	0.2	9.0	-	-	4.5	
	IB-17572	Macgee 12-24	Sandy Loam	6.4	0.1	3.0	-	-	3.0	
* Bay	IB-17573	Zak ~~Wilbay~~ Joyce 0-6	Sandy Loam	5.0	0.2	0.5	25.0	330	>12	Joyce Zak * H.Bay

Comment:

SASKATCHEWAN SOIL TESTING LABORATORY

Date: 11-07-89 FERTILITY ANALYSIS Page: 2 of 3

Brunner#IB-17549/17611 xxxK. Brunner Consultingxxx

* existing wild blueberry stand

Lab Number	Client Identification	Texture	pH	Conduct ms/cm	NO3-N ppm	P ppm	K ppm	SO4-S ppm	
IB-17574	Zak 6-12	Sand	5.0	0.1	0.5	-	-	3.5	Joyce Zak H.Bay *
IB-17575	Zak 12-24	Sand	5.5	0.1	0.5	-	-	2.0	
IB-17576	Neudorf 0-6	Loamy Sand	6.4	0.1	7.0	22.5	340	3.5	Clnnette Neudorf. P.A.
IB-17577	Neudorf 6-12	Loamy Sand	6.7	0.1	3.0	-	-	7.0	
IB-17578	Neudorf 12-24	Loamy Sand	6.7	0.1	3.5	-	-	5.5	
IB-17579	Holbeinpark 0-6	Loamy Sand	5.4	0.1	0.5	18.5	210	>12	Shellbrook lease * land. Harold Amundson
IB-17580	Holbeinpark 6-12	Loamy Sand	5.3	0.1	0.5	-	-	2.5	
IB-17581	Holbeinpark 12-24	Loamy Sand	5.6	0.1	0.5	-	-	2.0	
IB-17582	Perrault 0-6	Sandy Loam	7.4	0.4	5.0	6.5	80	5.5	Don Perrault H.Bay
IB-17583	Perrault 6-12	Sandy Loam	7.7	0.5	4.0	-	-	7.5	
IB-17584	Perrault 12-24	Loam	7.8	0.6	2.0	-	-	>12	
IB-17585	Oleniuk 0-6	Loam	7.3	0.4	18.5	>60	>450	9.0	Wanda Oleniuk P.A.
IB-17586	Oleniuk 6-12	Loam	7.2	0.4	20.0	-	-	7.0	
IB-17587	Oleniuk 12-24	Loam	7.2	0.4	22.0	-	-	5.5	
IB-17588	J Nichols 0-6	Loam	7.9	0.2	7.0	49.0	190	3.5	John+Sylv Nichols P.A.
IB-17589	J Nichols 6-12	Loam	7.8	0.2	7.0	-	-	3.5	
IB-17590	J Nichols 12-24	Loam	7.8	0.2	6.5	-	-	3.0	
IB-17591	L Bracken 0-6	Loamy Sand	7.2	0.1	1.5	40.0	95	3.0	Lockie Bracken H.Bay
IB-17592	L Bracken 6-12	Loamy Sand	7.1	0.1	1.0	-	-	5.5	
IB-17593	L Bracken 12-24	Loamy Sand	6.9	0.1	0.5	-	-	2.0	
IB-17594	Jantzon 0-6	Loam	6.8	0.4	25.5	>60	>450	7.0	Esther+Walt Jantzen. P.A.
IB-17595	Jantzon 6-12	Loam	6.7	0.4	24.5	-	-	7.0	
IB-17596	Jantzon 12-24	Loam	6.7	0.4	28.0	-	-	7.0	
IB-17597	Bill Klassen 0-6	Loamy Sand	7.6	0.1	1.5	8.0	80	1.5	Bill Klassen P.A.
IB-17598	Bill Klassen 6-12	Loamy Sand	7.6	0.1	1.0	-	-	2.0	

Comment:

SASKATCHEWAN SOIL TESTING LABORATORY

Date 11-07-89 FERTILITY ANALYSIS

Brunner#IB-17549/17611 ###K. Brunner Consulting###

* existing blueberry stand

Lab Number	Client Identification	Texture	pH	Conduct ms/cm	NO3-N ppm	P ppm	K ppm	SO4-S ppm	
IB-17599	Bill Klassen 12-24	Loamy Sand	7.3	0.1	1.0	-	-	2.0	Bill Klasse P.A.
IB-17600	Ross 0-6	Loam	7.6	2.2	37.5	>60	>450	>12	Janet Ross
IB-17601	Ross 6-12	Loam	7.7	2.5	42.0	-	-	>12	P.A.
IB-17602	Ross 12-24	Loam	7.6	2.9	29.5	-	-	>12	
IB-17603	Martin 0-6	Loam	7.3	0.3	9.0	>60	>450	9.0	Louise Martin
IB-17604	Martin 6-12	Sandy Loam	7.2	0.3	11.5	-	-	5.5	P.A.
IB-17605	Martin 12-24	Sandy Loam	6.9	0.4	23.0	-	-	4.0	
IB-17606	Shellbrook US 0-6	Sand	6.1	0.1	0.5	7.0	85	2.5	Harold Amundson
IB-17607	Shellbrook US 6-12	Sand	6.4	0.1	0.5	-	-	0.5	lease land
IB-17608	Shellbrook LS 0-6	Organic	5.3	0.3	0.5	6.0	125	>12	Harold
IB-17609	Shellbrook LS 6-12	Loamy Sand	5.9	0.1	0.5	-	-	9.0	lease land
IB-17610	B&S Rodwin 0-6	Loam	7.7	0.3	5.0	11.5	120	5.0	Bob + Stella
IB-17611	B&S Rodwin 6-12	Loam	7.8	0.5	16.0	-	-	>12	P.A. Rodwin

Comment:

###End###

SASKATCHEWAN SOIL TESTING LABORATORY
FERTILITY ANALYSIS

Date: 14-08-89
Brunner#I9-02226/02310

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~~Brunner~~ Blueberry

* existing wild blueberry stand

Lab Number	Client Identification	Texture	pH	Conduct ms/cm	NO3-N ppm	P ppm	K ppm	SO4-S ppm	
I9-02226	Schrder Jcpn Blf 0-6	Sand	4.7	0.4	3.8	>60	275	>12	Evelyn Schnaider
I9-02227	Schrder Jcpn Blf 6-12	Sand	4.8	0.1	1.4	-	-	6.5	
I9-02228	Schrder Jcpn Blf 12-24	Sand	5.2	0.1	2.4	-	-	7.0	M. Lake
I9-02229	J Spilchuck 0-6	Loamy Sand	6.8	0.4	31.9	>60	290	9.0	Jean Spilchuk
I9-02230	J Spilchuck 6-12	Sandy Loam	7.1	0.6	49.6	-	-	6.0	
I9-02231	J Spilchuck 12-24	Loam	7.3	0.5	34.3	-	-	5.5	P.A.
I9-02232	Dalpe Grvlplt S3 0-6	Organic	6.4	0.2	0.9	15.0	235	4.0	Bernard Dalpe
I9-02233	Dalpe Grvlplt S3 6-12	Loamy Sand	5.8	0.1	0.3	-	-	3.5	
I9-02234	Dalpe Grvlplt S3 12-24	Loamy Sand	5.9	0.1	0.3	-	-	2.5	M. Lake *
I9-02235	Colin Cloaree 0-6	Sand	6.9	0.1	2.3	16.5	70	2.0	Colin Cloarec
I9-02236	Colin Cloaree 6-12	Sand	7.0	0.1	1.4	-	-	3.0	
I9-02237	Colin Cloree 12-24	Sand	7.1	0.1	1.0	-	-	2.0	P.A.
I9-02238	Williamson 0-6	Organic	5.3	0.2	0.4	13.5	140	9.0	Robert + Karin Williamson.
I9-02239	Williamson 6-12	Sand	4.9	0.1	0.3	-	-	5.0	
I9-02240	Williamson 12-24	Sand	5.1	0.1	0.3	-	-	2.5	Nipawin *
I9-02241	Jackow Garden 0-6	Loam	7.4	0.6	53.5	12.5	95	5.5	Dave Jackow
I9-02242	Jackow Garden 6-12	Loam	7.8	0.3	13.3	-	-	3.5	
I9-02243	Jackow Garden 12-24	Loam	8.2	0.4	13.5	-	-	3.5	Shellbrook
I9-02244	Crun Lnd by Rein 0-6	Organic	6.1	0.3	0.5	20.0	210	7.0	Sharon + Ed Rein
I9-02245	Crun Lnd by Rein 6-12	Sand	5.2	0.1	0.3	-	-	4.0	
I9-02246	Crun Lnd by Rein 12-24	Sand	5.2	0.1	0.2	-	-	3.0	Nipawin
I9-02247	Wst Side Catry 0-6 Qvallie	Organic	6.4	0.2	0.5	20.0	255	5.0	ORIG Qvallie
I9-02248	Wst Side Catry 6-12	Sand	6.3	0.2	0.7	-	-	5.0	*
I9-02249	Wst Side Catry 12-24	Loamy Sand	6.0	0.1	0.2	-	-	2.5	
I9-02250	J Spilchuck S1/4 0-6	Organic	5.8	0.2	0.3	13.5	130	6.5	Jean Spilchuk Nipawin

Comment:

SASKATCHEWAN SOIL TESTING LABORATORY

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Brunner:I9-02226/02310 xxxx. Brunnerxxx

* existing wild blueberry stand

Lab Number	Client Identification	Texture	pH	Conduct as/cm	NO3-N ppm	P ppm	K ppm	SO4-S ppm	
I9-02251	J Spilchuck S1/4 6-12	Sand	5.5	0.1	0.3	-	-	4.5	Jean Spilchuck Nipawin
I9-02252	J Spilchuck S1/4 12-24	Sand	5.4	0.1	0.3	-	-	3.5	
I9-02253	Jackow bush 0-6	Organic	5.8	0.3	0.3	23.5	205	10.0	Dave Jackow Shellbrook *
I9-02254	Jackow bush 6-12	Sand	5.2	0.1	0.3	-	-	7.0	
I9-02255	Jackow bush 12-24	Loamy Sand	5.4	0.1	0.2	-	-	4.5	
I9-02256	Forbes leaseland 0-6	Organic	5.6	0.1	0.3	15.0	205	5.5	Gloria Forbes * Nipawin
I9-02257	Forbes leaseland 6-12	Sand	5.3	0.1	0.3	-	-	3.0	
I9-02258	Forbes leaseland 12-24	Sand	5.6	0.1	0.2	-	-	2.5	
I9-02259	Newmans 0-6	Organic	6.3	0.2	0.5	21.0	180	5.0	Leonard Margaret Newman Nipawin *
I9-02260	Newmans 6-12	Sand	5.2	0.1	0.2	-	-	2.0	
I9-02261	Newmans 12-24	Loamy Sand	5.5	0.1	0.2	-	-	1.5	
I9-02262	Shrdr Thndr Cntry 0-6	Sand	4.8	0.1	0.3	21.0	85	3.5	Evelyn Schnaider * M. Lake
I9-02263	Shrdr Thndr Cntry 6-12	Sand	4.8	0.1	0.2	-	-	2.0	
I9-02264	Shrdr Thndr Cntry 12-24	Sand	5.0	0.1	0.2	-	-	1.0	
I9-02265	Aspn stnd S Qulls 0-6	Organic	6.3	0.3	0.4	21.5	165	7.5	Orin Qualli *
I9-02266	Aspn stnd S Qulls 6-12	Loamy Sand	5.3	0.1	0.3	-	-	4.0	
I9-02267	Aspn stnd S Qulls 12-24	Loamy Sand	5.6	0.1	0.3	-	-	2.0	
I9-02268	Cemetery 0-6	Organic	6.8	0.2	0.4	13.0	170	5.0	Orin Qualli *
I9-02269	Cemetery 6-12	Sand	6.2	0.1	0.3	-	-	5.0	
I9-02270	Cemetery 12-24	Sand	5.9	0.1	0.2	-	-	1.5	
I9-02271	Quaille 0-6	Sand	6.4	0.3	0.7	18.0	190	8.5	Orin Qualli *
I9-02272	Quaille 6-12	Loamy Sand	6.3	0.1	0.3	-	-	2.0	
I9-02273	Quaille 12-24	Sand	6.3	0.1	0.3	-	-	2.0	
I9-02274	Alvin Hill 0-6	Sand	6.2	0.1	2.9	38.0	85	5.5	Alvin Hill
I9-02275	Alvin Hill 6-12	Sand	5.9	0.1	2.2	-	-	3.5	

Comment:

SASKATCHEWAN SOIL TESTING LABORATORY

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Brunner#I9-02226/02310 ###K. Brunner###

Lab Number	Client Identification	Texture	pH	Conduct mS/cm	NO3-N ppm	P ppm	K ppm	SO4-S ppm	
I9-02276	Alvin Hill 12-24	Sand	6.2	0.1	1.2	-	-	3.0	Alvin Hill
I9-02277	Grahan 0-6	Organic	5.9	0.3	0.8	25.0	330	9.0	Roy + Rita Graham. * m.Lake
I9-02278	Grahan 6-12	Loamy Sand	5.6	0.1	0.3	-	-	2.0	
I9-02279	Grahan 12-24	Loamy Sand	5.8	0.1	0.3	-	-	1.0	
I9-02280	Forbes Pasture 0-6	Organic	6.3	0.3	0.6	20.0	145	7.0	Gloria Forbes Nipawin *
I9-02281	Forbes Pasture 6-12	Sand	5.7	0.1	0.3	-	-	3.5	
I9-02282	Forbes Pasture 12-24	Sand	5.5	0.1	0.3	-	-	3.5	
I9-02283	Peterson Cltvd 0-6	Loam	6.2	0.2	0.3	9.5	190	2.0	Rod. + Hazel Peterson. Nipawin
I9-02284	Peterson Cltvd 6-12	Loam	6.1	0.1	0.3	-	-	1.5	
I9-02285	Peterson Cltvd 12-24	Loam	6.0	0.1	0.3	-	-	1.0	
I9-02286	Pffr Strubrry fld 0-6	Loam	6.6	0.5	22.8	>60	>450	10.0	Sheldon Pieffer Nipawin
I9-02287	Pffr Strubrry fld 6-12	Loam	5.0	0.8	51.4	-	-	>12	
I9-02288	Pffr Strubrry fld 12-24	Loam	6.2	0.9	51.0	-	-	>12	
I9-02289	Froese Cltvtd 0-6	Sand	6.4	0.2	4.4	23.5	240	3.0	Jake + Viola Froese.
I9-02290	Froese Cltvtd 6-12	Sand	6.1	0.1	1.5	-	-	2.5	
I9-02291	Froese Cltvtd 12-24	Sand	5.9	0.1	0.6	-	-	2.0	
I9-02292	Alvin Mitchell 0-6	Organic	5.6	0.1	0.3	15.0	105	5.0	Gloria Forbes Nipawin *
I9-02293	Alvin Mitchell 6-12	Loamy Sand	5.3	0.1	0.3	-	-	2.0	
I9-02294	Alvin Mitchell 12-24	Sand	5.4	0.1	0.3	-	-	1.0	
I9-02295	Quaille bluff 2 0-6	Sand	6.1	0.1	1.0	21.0	110	2.5	
I9-02296	Quaille bluff 2 6-12	Sand	6.1	0.1	0.6	-	-	1.5	Orin Quallie *
I9-02297	Quaille bluff 2 12-24	Sand	6.1	0.1	0.4	-	-	1.0	
I9-02298	Carl Perrin 0-6	Loam	6.5	0.5	12.3	45.0	>450	>12	Carl Perrin. Nipawin
I9-02299	Carl Perrin 6-12	Loam	6.9	0.7	28.5	37.5	375	>12	
I9-02300	Fir Rvr Rd Plt 2 0-6	Organic	5.1	0.1	0.8	11.5	125	7.0	Don Perrault * Hi.Bay

Comment:

SASKATCHEWAN SOIL TESTING LABORATORY

Date: 14-08-89 FERTILITY ANALYSIS

BrunnerxI9-02226/02310 xxxK. Brunnerxxx

Lab Number	Client Identification	Texture	pH	Conduct mS/cm	NO3-N ppm	P ppm	K ppm	SO4-S ppm
I9-02301	Fir Rvr Rd Plt 2 6-12	Loamy Sand	5.2	0.1	0.3	6.0	50	2.0
I9-02302	Bradshaw 0-6	Organic	6.0	0.3	0.4	23.0	255	12.0
I9-02303	Bradshaw 6-12	Sand	4.6	0.1	0.3	13.5	75	7.0
I9-02304	Forbes Gdn 0-6	Sandy Loam	7.3	0.3	9.6	>60	135	5.0
I9-02305	Forbes Gdn 12-24	Loamy Sand	7.8	0.2	1.6	52.5	40	3.5
I9-02306	Staffen Rvr Fld 0-6	Loam	7.7	0.3	5.4	17.0	265	5.5
I9-02307	Staffen Rvr Fld 12-24	Loam	7.7	0.3	9.6	8.0	105	4.5
I9-02308	Froese Uncltvd Cbn 0-6	Organic	6.1	0.2	2.5	15.0	175	4.0
I9-02309	Froes Uncltvd Cbn 12-24	Sand	5.2	0.1	0.3	12.5	55	2.0
I9-02310	B & S Rodwin P.A. 12-24	Loam	7.9	0.5	15.4	11.0	90	>12

Hi Bay * Don Perrault

Gloria Forbes Nipawin

Pieter Staffen Nipawin

Jake & Viola Froese Nipawin *

Bob & Stella Rodwin P.A.

Comment:

xxxEndxxx

SASKATCHEWAN SOIL TESTING LABORATORY
FERTILITY ANALYSIS

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18-09-89
Brunner*19-05688/05699
Kayla Brunner

Number	Client Identification	Texture	pH	Conduct ds/cm	NO3-N ppm	P ppm	K ppm	SO4-S ppm
19-05688	Dennis Olsen 0-6	Loamy Sand	5.7	0.2	>0.5	16.0	150	10.0
19-05689	Dennis Olsen 6-12	Sandy Loam	5.8	0.1	>0.5	32.5	55	2.0
19-05690	Dennis Olsen 12-24	Sandy Loam	5.9	0.1	>0.5	39.0	40	1.5
19-05691	K Shaaber Hill 0-6	Loamy Sand	5.8	0.1	>0.5	26.0	90	3.5
19-05692	K Shaaber Mead Lk 6-12	Loamy Sand	6.2	0.1	>0.5	9.0	50	2.0
19-05693	K Shaaber Low Land 0-6	Loamy Sand	6.0	0.1	>0.5	7.5	55	2.5
19-05694	Nimmrichter Mead Lk 0-6	Sand	5.5	0.2	>0.5	20.5	210	>12
19-05695	Nimmrichter Mead L 6-12	Sand	5.7	0.1	>0.5	12.5	85	4.0
19-05696	Nimmrichter Mead 12-24	Sand	6.0	0.1	>0.5	35.5	75	2.0
19-05697	Ron Hooper Weekes Garde	Loam	6.7	0.4	11.5	19.0	150	4.0
19-05698	Ron Hooper Weekes 6-12	Loam	7.0	0.5	7.0	6.5	95	3.0
19-05699	E Schnaider Garden 0-6	Loam	6.7	0.6	50.5	>60	300	5.0

M. Lake *
Dennis Olsen

Ken Schamber
M. Lake *

M. Lake *
H. Nimmrichter

Ron Hooper
M. Lake *
Evelyn Schnaider

Comment:

End